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INTERREG VI-A ITALY-SLOVENIA 2021-2027

STRATEGIC ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL REPORT

April 2022

Contracting Authority: **Autonomous Region Friuli Venezia Giulia**
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Accounting Unit
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Introduction

In parallel to the preparation of the Interreg Italy-Slovenia Programme for the programming period 2021–2027, a Strategic Environmental Assessment (SEA) has being conducted. The SEA aims to contribute to the integration of environmental considerations and ensure a high level of environmental protection in the preparation and adoption of the programme. The legal basis for such an assessment are the *Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment* ("SEA Directive"), the *UNECE Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context* ("SEA Protocol") and the Procedure for the Strategic Environmental Assessment (SEA), the Environmental Impact Assessment (EIA) and the Integrated Pollution Prevention Control (IPPC) procedure *(Dlgs 152/2006, Official Gazette of the Republic of Italy, No. 88/2006)*.

The assignment was performed in an interactive way through regular virtual meetings between the contractor and the Interreg Italy-Slovenia Managing Authority and exchanges on the progress of the SEA with the Interreg Italy-Slovenia 2021-2027 Programming Task Force that elaborates the programme. This SEA is based on the draft programme strategy as outlined in the proposed Interreg Programme (IP). The assessment has taken into consideration the fact that the IP primarily focuses on transnational coordination, strategic and operational planning, capacity building and skills improvement, best practice transfer and knowledge exchange. It involves "limited investment" interventions - any supported actions with an "investment character" will be supported for the purpose of the piloting of innovative solutions. This often means that only localised direct impacts can be reasonably expected in case of specific projects and their pilot actions.

This document represents the environmental report which is the core output of the SEA procedure. To comply with its cross-border character and ensure widest possible outreach to interested public, it contains a non-technical summary of the environmental report – summarizing its conclusions in English, Italian and Slovenian languages.

TIME LIMITATIONS

The time frame of the SEA is determined by the period of validity of the programme under evaluation. This is primarily the duration of the programming period from 2021-2027 but includes the subsequent period until 2029 as well. Based on the Commission's proposed regulations on the rules for the ESI funds, the ERDF and INTERREG, programme-based payments are still possible for this time. Thus, at the current point in time, the formal programme closure is to be regarded as the end date of possible financing. To assess the status quo and possible future developments, the latest available data is used as the basis for this SEA.

SPATIAL LIMITATIONS

In spatial terms, the area of expected environmental impacts of the assessed IP is determined by the area of its validity. Therefore, the primary investigation area is the territory of the cross-border area of Italy and Slovenia. Most of the expected environmental impacts are nevertheless likely to be limited to this primary study area, as the majority of the measures have a strong regional focus. However, some individual measures, especially climate- or air/water-related (which cannot always be strictly spatially delineated), are assessed beyond the primary study area. Of particular relevance here are significant transboundary environmental impacts (effecting other countries than Slovenia or Austria), the occurrence of which, according to Article 7 of the SEA Directive, requires the possibility for the affected state to be involved in a consultation process.

CONTENT LIMITATIONS AND DEPTH OF THE ASSESSMENT

The subject of this SEA is the Interreg Italy-Slovenia 2021-2027 Programme (hereinafter IP), for which the expected environmental effects of particular measures of the programme are assessed. The target framework is set at an international, EU, national and regional level. The delimitation of the included objectives or the corresponding protective goods (see Chapter **Errore. L'origine riferimento non è stata trovata.**) is determined by The SEA directive. These conditions determine the depth of the assessment, which is directly linked to the measures of the programme. However, due

to the nature of the IP, these measures do not relate to concrete projects but define solely the framework of possible projects. Thus, the way certain projects are delimited depends on the particular level of detail of the measures presented in the IP. This rather abstract nature of the programme influences the assessment of potential environmental impacts and results in a primarily qualitative evaluation.

Non-technical summary

This chapter summarizes the main results and outcomes of the SEA process for the Interreg VI-A Italy-Slovenia 2021-2027 Programme (IP).

For more details, please refer to relevant chapters of the Environmental Report.

Overview of the Programme

The Interreg VI-A Italy-Slovenia 2021-2027 Programme (IP) is a programme in the framework of the European Territorial Cooperation (ETC) and funded by the European Regional Development Fund (ERDF). The purpose of such Cross-Border programmes is to support Member States to implement joint projects, address joint challenges and overcome border obstacles.

The Programme area extends over a total surface of 19,841 km^2 and has a total population of approximately 3 million inhabitants. It covers 5 Italian NUTS 3 regions (Venice, Udine, Pordenone, Gorizia and Trieste) and 5 Slovenian NUTS 3 regions (Primorsko-notranjska, Osrednjeslovenska, Gorenjska, Obalno-kraška and Goriška).

The IP highlights six main areas where to intervene to improve the living conditions of all agents and the population of the Programme area. They are:

1. Research and Innovation;
2. Energy, Climate change and Sustainable Development;
3. Labour Market, Human Capital and Linguistic Minorities, Healthcare;
4. Connectivity and Transports;
5. Natural and Cultural heritage and Tourism;
6. Governance.

Priorities (POs) and Specific Objectives (SOs) are described in the next table, along with funding.

Priorities	Specific Objectives	Financial endowment
PO 1 - A more competitive and smarter Europe	**SO 1.1** - Developing and enhancing research and innovation capacities and the uptake of advanced technologies	€ 6.439.065,00 (9,7%)
PO 2 - A greener, low-carbon transitioning towards a net zero carbon economy and resilient Europe	**SO 2.4** - Promoting climate change adaptation and disaster risk prevention, and resilience, taking into account eco-system based approaches	€ 9.342.721,00 (14,1%)
	SO 2.6 - Promoting the transition to a circular and resource efficient economy	€ 5.294.208,00 (8,0%)
	SO 2.7 - Enhancing protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution (also includes the POSEIDONE strategic project)	€ 10.171.344,00 (15,4%)
PO 4 - A more social and inclusive Europe	**SO 4.6** - Enhancing the role of culture and sustainable tourism in economic development, social inclusion and social innovation (also includes the ADRIOCYCLETOUR strategic project and another one for the joint management and sustainable development of the Classical Karst Area)	€ 29.853.250,00 (45,0%)
ISO 1 – Better Cooperation Governance	**ISO 1 (b) -** Enhance efficient public administration by promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular with a view to resolving legal and other obstacles in border regions	€ 3.659.845,00 (5,5%)
	ISO 1 (c) - Build up mutual trust, in particular by encouraging people-to-people actions	€ 1.500.000,00 (2,3%)
Total		***€ 66.260.433,00 (100,0%)***

The Interreg VI-A Italy-Slovenia 2021-27 Programme will coordinate with the existing priorities under EUSALP and EUSAIR macro-regional strategies to create synergies with regular projects and their flagship projects. Furthermore, IP shows clear complementarity and potential to exploit synergies with other programmes and frameworks like European Green Deal, Alpine space, Adrion, Italy-Austria, Slovenia-Croatia, etc.

IP will also be committed to ensuring the respect of the horizontal principles outlined in the Charter of Fundamental Rights of the European Union including gender equality, non-discrimination, accessibility and sustainable development throughout preparation, implementation, monitoring, reporting and evaluation of projects taking into account the UN Sustainable Development Goals, the Paris

Agreement and the "do no significant harm" principle.

For more details about the IP, please refer to chapter 1 of the Environmental Report.

Methodological approach, alternatives and the SEA process

The SEA was conducted in accordance with the *EU Directive 2001/42/EC* and the *SEA Protocol*. The relevant frame for assessments was set up by the environmental aspects outlined in the SEA Directive and the subsequently identified relevant environmental objectives which are potentially impacted by the programme.

The IP has been agreed upon by National delegations, deciding that it is best suited for the needs of the area, and effective within its available budget. Therefore, there were no programme level alternatives of the Interreg Italy-Slovenia 2021-2027 Programme that were considered within this SEA Report. The event of not implementing the programme (i.e. the "zero alternative") is quite unlikely. In this situation the baseline conditions of the programme area would remain the same, i.e. the positive and adverse programme implementation impacts would not occur and currently identified trends would most likely continue.

The goal of this particular SEA was to further strengthen environmental considerations in the IP through proposed enhancement measures and to mitigate any identified negative impacts on environment through proposed mitigation measures, which could take form of additionally proposed activities to be supported by the IP or modification of already proposed activities by the IP.

Impacts were assessed on the basis of changes in impact indicators in regard to the state of the environment and the importance of these changes, the level at which environmental protection objectives were taken into account during the IP preparation and other evaluation criteria.

Potential impacts identified in the scoping phase were more precisely defined in the Environmental Report and assessed based on the following impact assessment key:

+2	+1	0	-1	-2	T+	T-
Significant positive impact	Non-significant positive impact	Very limited impact or no impact	Non-significant adverse impact	Significant adverse impact	Transboundary positive impact	Transboundary negative impact

Finally, mitigation and enhancement measure were proposed. The SEA team was engaged early on in the programming process and was able to establish a constructive cooperation with all stakeholders. SEA team was also invited to follow and contribute to Task Force meetings. Subsequently, the SEA team was able to closely monitor the programming process. This resulted in its' regular inputs at key moments of the programming process.

As a result of all above presented activities, we can report that a significant number of proposed mitigation measures, enhancement measures and recommendations were already integrated in the final draft version of the IP (final draft version 5, dated with 31st March 2022) – clearly reflecting the added value of the SEA in the programming process.

However, this environmental report represents only one of several steps of the whole SEA process:

Steps of the SEA process	Schedule	Status
Kick off meeting	December 2020	Completed
Integrating SEA into the programming process timeline	January-May 2021	Completed
Scoping and consultations with environmental authorities	June-October 2021	Completed
Draft Environmental Report	November 2021-March 2022	Completed
Internal revision of the Draft Environmental Report & coordination with the Programming team	March 2022	Completed
Final Draft Environmental Report	March 2022	Completed
Approval of the Final Draft Environmental Report by Responsible Environmental Authorities	April 2022	Ongoing
Consultations of responsible Environmental Authorities and the public on Environmental Report	May 2022	-
Documentation of consultations and final Environmental Report	June 2022	-
Environmental statement	After IP adoption	-
Expected end of the process	June-July 2022	-

Conclusions of the Scoping process

The scoping processes involving all responsible environmental authorities from the programme area was started in June 2021. Predominantly positive impacts of IP on environment were recognized during the scoping, with three points of concern or potentially negative impact exposed:

- increased pressures to environment due to increased tourism;
- potential negative impact of new small-scale infrastructures;
- potentially adverse impacts on tangible and intangible attributes of cultural and natural heritage.

In both countries a written scoping procedure was carried out and in Slovenia an on-line workshop was also organized. Based on received responses and comments the final version of Scoping Report was prepared in October 2021. The SEA team used the inputs form the scoping procedure to define environmental objectives of the Environmental Report and indicators used to assess impacts of the IP on the environment.

Environmental aspects, issues and concerns

Based on conclusions from scoping, all environmental aspects and all identified environmental issues and concerns have been made the subject of the SEA assessment. The analysis of environmental policy frameworks on international and national levels resulted in definition of the following environmental issues and concerns.

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL ISSUES AND CONCERNS
Air	Air pollution
Climate	Climate change mitigation (GHG emission reductions, renewable energy, energy efficiency)
	Climate change adaptation (adaptive capacity and adaptation measures)
Water	Protection and restoration of water ecosystems and wetlands
	Hydro-morphological pressures
	Pollution pressures on surface water and links to human health
	Pollution pressures on groundwater and links to human health
	Water abstraction and its pressures on surface water bodies and groundwater
Soil and land use	Ensuring sustainable use of land and soil
	Preventing loss of soil and soil pollution
Biodiversity and Natura 2000	Protection and preservation of biodiversity and natural ecosystems
	Protection and preservation of Natura 2000 species and habitats
	Promotion of green infrastructure and ecosystem-based management
Cultural heritage	Protection and preservation of cultural heritage
	Promotion of participatory management of cultural heritage
Landscape	Protection and preservation of landscapes
	Protection and valorization of geodiversity and geological heritage
Population and human health	Impacts of noise pollution on human health and well-being
	Solid and hazardous Waste
	Public health and environmental health
	Impacts of climate change (floods) on human health and well-being
	Impacts of noise pollution on human health and well-being

This list was the basis for the preparation of the current state of environment in the area, as well as the environmental assessments of the “zero alternative” (ZA) and the IP.

The current state of the environment and the zero alternative

The SEA team relied on publicly available data, monitoring reports and own GIS and statistical analysis to describe the current state of the environment and Zero Alternative (ZA) trends per individual environmental segments. Analysis was focused on pre-identified key indicators, later on also used in the potential impact assessment process.

ENVIRONMENTAL ASPECTS	INDICATORS	STATE OF ENVIRONMENT & ZERO ALTERNATIVE TRENDS	
		ITALY	SLOVENIA
Air	Average emission levels of the main air pollutants (NOx, PM10, PM2,5, O3, SO2)	↗ ↔	↗ ↔
Climate	Greenhouse gas emissions	↘ ↔	↗
	Share of renewable energy in gross final energy consumption	↔	↗
	Final energy consumption	↗	↗
Water	Ecological and chemical status of surface water bodies	↘ ↔	↘ ↔
	Chemical status of groundwater bodies	↔	↔
	Quantitative status of groundwater	↔	↔
	Water Exploitation Index	↔	↔
Soil	Land take	↘	↘
	Land use/cover change by categories	↘	↘
	Area of functionally de-graded areas	↘	↘
	Quality of soil and soil pollution	↘	↔
Biodiversity	Development of nature protection areas (by categories)	↔	↗
	Favourable condition of species of European interest	↘	↘
	Favourable condition of habitats of European interest	↗	↗
Landscape and cultural heritage	Registered units of cultural heritage	↗	↘
	Intangible cultural heritage	↗	↘
	Extension of protected landscapes	↗	↗
	Risk of agri-cultural land abandonment	↔	↘
	Landscape fragmentation	↘	↘
Human health and well-being	Number of people exposed to air pollution	↗ ↔	↗
	Population exposed to excessive noise levels	↔ ↘	↗
	Generated solid waste per capita	↘	↘
	Selected solid waste	↗	↗
	'Equivalent personnel' for every thousand 'equivalent patients'	↔ ↘	↘
	Number of people affected by flood risk	↔ ↘	↗

State of environment trend and zero alternative (ZA) foreseen development:
↑ Improving trend; ↗ Partially or gradually improving trend; ↔ Unchanged trend; ↘ Partially or gradually deteriorating trend; ↓ Deteriorating trend

Impact identification and assessment

Potential impacts identified in the scoping phase were reconsidered and more precisely defined and described. It was concluded that the IP is expected give contribution to many positive impacts on all environmental aspects. However, the following potentially negative impacts have been identified:

- Increased air pollution and higher risk to public health due to higher emission levels of the air pollutants (CO, NMVOC, NOx, PM10, PM2.5) due to increased traffic flows, especially in touristic areas.
- Increased pressures to environment due to increased and dispersed tourism flows (increased energy consumption, increased traffic flows, soil loss and sealing, increased waste production and water pollution, increased natural resources consumption, disruption of flora/fauna in protected areas and Natura 2000).
- Potential negative impact of new infrastructures (soil loss and sealing, hydro-morphological damages to surface waters, fragmentation).
- Diverse impacts on tangible and intangible attributes of cultural and natural heritage due to increased tourism flows and with-it interlinked need for more tourist infrastructure and new tourism products/services.

Impacts were assessed on the basis of changes in impact indicators in regard to of the state of the environment and the importance of these changes, the level at which environmental protection objectives were taken into account during the IP preparation and other evaluation criteria.

As evident from the overview provided below, the IP is clearly oriented towards sustainable development and search for green solutions by design. Since all projects and their potential actions with an "investment character" need to be implemented in line with national level legislation and standards, no potentially significant adverse impact was foreseen even for the realistic worst/case scenario of the IP programme implementation. The transboundary effects of the proposed IP are exclusively positive.

IP SPECIFIC OBJECTIVES	ENVIRONMENTAL ASPECTS						
	Air	Climate	Water	Soil and land use	Biodiversity	Landscape	Pop. and human health
SO 1.1	0	+1	0	+1	0	0	+1
SO 2.4	0	+2 T+	+1 -1	+1 -1	+1 -1	+1 -1	+2 T+
SO 2.6	+1	+1	+1	+1	+1	+1	+1
SO 2.7	+2	+1	+1 T+	+1	+2	+2	+2
SO 4.6	+1 -1	+2 -1 T+	+1 -1	-1	+2 -1	+2 -1	+2 -1
ISO 1b	+1 T+	+1	0	0	0	0	+1 T+
ISO 1c	0	0	0	0	0	+1	+1

No significant negative impacts have been identified in the SEA for any of seven SOs of the Interreg VI-A Italy-Slovenia 2021-2027 Programme, and only non-significant negative impacts have been identified for two out of seven SOs. Furthermore, the whole IP is placing a strong emphasis on improving the environmental situation and addressing key environmental and sustainability concerns.

For identified non-significant negative impacts mitigation measures have been foreseen, as well as recommendations for further enhancement of identified positive impacts of the IP. Many of them were al-ready addressed and integrated into the IP, as described in chapter 1.5. Those that remain are:

Proposed mitigation measures	Targeted SO / *Environmental aspects*
The IP should encourage all applicants applying to SO 2.4 and 4.6 to use *"environmental sustainability by design"* approach through the project selection process. Applicants should explain whether and how their proposed actions take into the consideration potential increase of tourist flows, improvement of the sustainability of their tourism offer and/or contribute to reduction of carbon footprint of their tourism products/services (e.g. new tourism products/services based on sustainable mobility solutions or public transport, systemic efforts to reduce or optimize tourism flows, etc.), as well as effective and sustainable use of natural re-sources or contribute to regeneration of the environment and ecosystem services – for example in the dedicated section of the project application templates. Subsequently, the IP should prefer to co-finance projects with sustainable solutions integrated in project design.	2,4 and 4.6 *Air, Climate, Water, Soil, Biodiversity and Natural heritage, Landscape and Cultural heritage, Population and human health*
Consider and assess the impact of ADRIONCYCLETOUR infrastructure on the local water system.	4.6 *Water*

Proposed enhancement measures and recommendations	Targeted SO / Environmental aspects
The IP should encourage the applicants to consider potential linkages between actions within ISO 1b (non-urban multimodal transport) and SO 4.6 (ADRIONCYCETOUR).	4.6 and ISO 1b *Air, Climate*
The following action could be added to SO 2.6 (or any other SO, if considered a better fit from the IP programming team) as an IP enhancement measure: "Promoting business networks embedding climate change mitigation and adaptation (along with other relevant environmental factors) into existing business operations and core corporate decision-making processes (e.g. product development, etc.)".	2.6 *Climate*

Based on all above findings, the final conclusion of this Environmental Report is that impacts of the implementation of the Interreg Italy-Slovenia 2021-2027 Programme on environment will be predominantly positive, while identified non-significant negative impacts can be mitigated by proposed mitigation measures.

Appropriate Assessment was also conducted as an integral part of the SEA process linked to Interreg Italy-Slovenia 2021-2027 Programme. The main indication provided is the acknowledgement that no IP objective nor prospected action is incompatible with the Habitat and Birds Directives. For more information on the Appropriate Assessment and its findings, please refer to Annex 1 to this Environmental Report

Proposed monitoring

Since no significant negative impacts have been identified in the SEA for any of seven SOs of the Interreg VI-A Italy-Slovenia 2021-2027 Programme, no mandatory monitoring measures are necessary to be implemented.

However, to measure the enhancement of the IP impact and to ensure coherence with assessments of the SEA we recommend monitoring measures that are linked to the most sensitive and mostly affected aspects:

- Number of the studies of the carrying capacity of the protected areas, prepared as a part of supported projects.
- Number of visitor management plans in protected areas, prepared as a part of supported projects.
- Number of newly developed sustainable tourism products/services/activities, developed as a part of supported projects.
- Number of sustainable mobility/accessibility strategies targeting tourists as one of key target groups, developed as a part of supported projects.

We also recommend that the monitoring of possible environmental effects is ideally reflected throughout the project cycle, as presented in detail in chapter 8.

Do No Significant Harm principle assessment

The DNSH principle is aimed to ensure that Cohesion funds support activities and investment in line with climate and environmental standards and objectives of the European Union, asking to assess the degree of harmfulness of actions and investments on six environmental fields:

1. Mitigation of climate change;
2. Adaption to climate change;
3. Quality of fresh and marine water;
4. Circular economy, with emphasis on waste prevention and recycling;
5. Pollution of air, soils and water;
6. Protection of biodiversity.

The SEA Environmental Report takes care of the DNSH, ensuring that whatever relates with the six mentioned environmental objectives for DNSH is evident and easily detectable in the environmental report itself.

Following the Italian national guidelines and considering the specific issues highlighted in the SEA,

we find out a substantial compliance of the IP to the DNSH principle assessment: in just two out of seven SOs, the compliance degree is lower than 100%. They are SO 2.4, with a non-full compliance degree ranging from 80% for biodiversity to 90% for water, and SO 4.6 (non-full compliant for any DNSH environmental objective, from 75% for Pollution and Water to 85% for biodiversity).

	SO 1.1	SO 2.4	SO 2.6	SO 2.7	SO 4.6	ISO 1b	ISO 1c
1. Climate – Mitigation	100%	100%	100%	100%	80%	100%	100%
2. Climate Adaption	100%	100%	100%	100%	80%	100%	100%
3. Water	100%	90%	100%	100%	75%	100%	100%
4. Circular economy	100%	100%	100%	100%	80%	100%	100%
5. Pollution	100%	85%	100%	100%	75%	100%	100%
6. Biodiversity	100%	80%	100%	100%	85%	100%	100%

The list of proposed measures to re-establish a 100% compliance are the same mitigation measures reported in the SEA, namely: encouraging all candidates applying to SO 4.6 to use “environmental sustainability by design” approach; requiring the explanation of potential infrastructures impact on environmental items at the local level for ADRIONCYCLETOUR.

Sintesi non tecnica

Questo capitolo riassume i principali risultati e prodotti del processo di VAS per il Programma Interreg VI-A Italia-Slovenia 2021-2027 (IP).

Per maggiori dettagli si rimanda ai relativi capitoli del Rapporto Ambientale.

Visione di insieme del Programma

Il Programma Interreg VI-A Italia-Slovenia 2021-2027 (IP) è un programma nell'ambito della Cooperazione Territoriale Europea (CTE) e finanziato dal Fondo Europeo di Sviluppo Regionale (FESR). Lo scopo dei programmi transfrontalieri è sostenere gli Stati membri nell'attuazione di progetti comuni, affrontare le sfide comuni e superare gli ostacoli alle frontiere.

L'area del Programma si estende su una superficie complessiva di 19.841 km^2 ed ha una popolazione complessiva di circa 3 milioni di abitanti. Copre 5 regioni NUTS 3 italiane (Venezia, Udine, Pordenone, Gorizia e Trieste) e 5 regioni NUTS 3 slovene (Primorsko-notranjska, Osred-njeslovenska, Gorenjska, Obalno-kraška e Goriška).

L'IP evidenzia sei aree principali in cui intervenire per migliorare le condizioni di vita di tutti gli attori sociali e della popolazione dell'area del Programma. Esse sono riportate nel seguente elenco:

1. Ricerca e Innovazione;
2. Energia, Cambiamenti Climatici e Sviluppo Sostenibile;
3. Mercato del Lavoro, Capitale Umano e Minoranze Linguistiche, Sanità;
4. Connettività e Trasporti;
5. Beni naturali e culturali e Turismo;
6. Governance.

Le priorità (OP) e gli obiettivi specifici (OS) sono descritti nella tabella seguente, insieme ai finanziamenti.

Priorities	Specific Objectives	Financial endowment
PO 1 - Un'Europa più competitiva e intelligente	**SO 1.1** - Sviluppare e rafforzare le capacità di ricerca e di innovazione e l'introduzione di tecnologie avanzate	€ 6.439.065,00 (9,7%)
PO 2 - Un'Europa resiliente, più verde e a basse emissioni di carbonio ma in transizione verso un'economia a zero emissioni nette di carbonio	**SO 2.4** - Promuovere l'adattamento ai cambiamenti climatici, la prevenzione dei rischi di catastrofe e la resilienza, prendendo in considerazione approcci ecosistemici	€ 9.342.721,00 (14,1%)
	SO 2.6 - Promuovere la transizione verso un'economia circolare ed efficiente sotto il profilo delle risorse	€ 5.294.208,00 (8,0%)
	SO 2.7 - Rafforzare la protezione e la preservazione della natura, la biodiversità e le infrastrutture verdi, anche nelle aree urbane, e ridurre tutte le forme di inquinamento (incluso anche il progetto strategico POSEIDONE)	€ 10.171.344,00 (15,4%)
PO 4 - Un'Europa più sociale e inclusiva	**SO 4.6** - Rafforzare il ruolo della cultura e del turismo sostenibile nello sviluppo economico, nell'inclusione sociale e nell'innovazione sociale (incluso il progetto strategico ADRIOCYCLETOUR e un altro per la gestione congiunta e lo sviluppo sostenibile dell'area del Carso Classico)	€ 29.853.250,00 (45,0%)
ISO 1 – Migliore governance della cooperazione	**ISO 1 (b) -** Rafforzare un'amministrazione pubblica efficiente promuovendo la cooperazione legale e amministrativa e la cooperazione tra cittadini, attori della società civile e istituzioni, in particolare al fine di risolvere gli ostacoli legali e di altro tipo nelle regioni frontaliere	€ 3.659.845,00 (5,5%)
	ISO 1 (c) - Costruire la fiducia reciproca, in particolare incoraggiando le azioni di cooperazione tra le persone	€ 1.500.000,00 (2,3%)
Total		***€ 66.260.433,00 (100,00%)***

Il programma Interreg VI-A Italia-Slovenia 2021-27 si coordinerà con le priorità esistenti nell'ambito delle strategie macroregionali EUSALP ed EUSAIR per creare sinergie con i progetti ordinari e i loro progetti bandiera. Inoltre, il Programma mostra chiare complementarità e potenzialità per sfruttare le sinergie con altri programmi e iniziative-quadro come il Green Deal europeo, lo spazio alpino, Adrion, Italia-Austria, Slovenia-Croazia, ecc.

Il Programma si impegnerà inoltre a garantire il rispetto dei principi orizzontali delineati nella Carta dei diritti fondamentali dell'Unione europea, tra cui uguaglianza di genere, non discriminazione, ac-

cessibilità e sviluppo sostenibile durante tutta la preparazione, l'attuazione, il monitoraggio, la rendicontazione e la valutazione dei progetti tenendo conto degli obiettivi di sviluppo sostenibile delle Nazioni Unite, dell'accordo di Parigi e del principio "non nuocere in modo significativo".

Per maggiori dettagli sul Programma si rimanda al Capitolo 1 del Rapporto Ambientale.

Approccio metodologico, alternative e processo di VAS

La VAS è stata condotta in conformità alla *Direttiva UE 2001/42/CE e al Protocollo VAS*. Il quadro di riferimento per le valutazioni è stato definito dagli aspetti ambientali delineati nella Direttiva VAS e dagli obiettivi ambientali identificati di conseguenza e potenzialmente interessati dal programma.

Il programma è stato concordato dalle delegazioni nazionali, decidendo che è più adatto alle esigenze dell'area ed efficace nell'ambito del budget disponibile. Pertanto, non sono emerse alternative a livello programmatico del Programma Interreg Italia-Slovenia 2021-2027 che sono state prese in considerazione all'interno del presente Rapporto VAS. L'evento di non attuazione del programma (ovvero l'"alternativa zero") è abbastanza improbabile. In questa situazione le condizioni di base dell'area del programma rimarrebbero le stesse, ovvero gli effetti positivi e negativi sull'attuazione del programma non si verificherebbero e molto probabilmente le tendenze attualmente identificate continuerebbero.

L'obiettivo di questa particolare VAS era di rafforzare ulteriormente le considerazioni ambientali nel IP attraverso proposte di misure di miglioramento e di limitare eventuali impatti negativi identificati sull'ambiente attraverso proposte di misure di mitigazione, che potrebbero assumere la forma di ulteriori attività proposte che devono essere sostenute dal IP o modifica di attività già proposte dal IP.

Gli impatti sono stati valutati sulla base dei cambiamenti intervenuti negli indicatori con riferimento allo stato dell'ambiente e alla rilevanza di tali cambiamenti, il grado di importanza assegnata agli obiettivi di tutela ambientale nella definizione del Programma e ad altri criteri di valutazione.

I potenziali impatti individuati nella fase di *scoping* sono stati definiti con maggiore precisione nel Rapporto Ambientale e valutati sulla base della seguente chiave di valutazione dell'impatto:

+2	+1	0	-1	-2	T+	T-
Impatto positivo significativo	Impatto positivo non significativo	Impatto limitato o nullo	Impatto negativo non significativo	Impatto negativo significativo	Impatto positivo transfrontaliero	Impatto negativo transfrontaliero

Infine, sono state proposte misure di mitigazione e miglioramento. Il team della VAS è stato coinvolto nella fase iniziale del processo di programmazione ed è stato in grado di stabilire una cooperazione costruttiva con tutte le parti interessate. Il team è stato inoltre invitato a seguire e contribuire alle riunioni della Task Force. Successivamente, il team ha potuto seguire da vicino il processo di programmazione. Ciò ha comportato i suoi input regolari nei momenti chiave del processo di programmazione.

Come risultato di tutte le attività sopra presentate, possiamo segnalare che un numero significativo di proposte di misure di mitigazione, misure di miglioramento e raccomandazioni erano già integrate nella bozza finale dell'IP (bozza finale versione 5, datata 31 marzo 2022) – riflettendo chiaramente il valore aggiunto della VAS nel processo di programmazione.

Tuttavia, questo rapporto ambientale rappresenta solo una delle numerose fasi dell'intero processo di VAS:

Fasi del processo di VAS	Calendario	Avanzamento
Riunione di avvio	Dicembre 2020	Completato
Integrazione della VAS nel processo di programmazione	Gennaio - Maggio 2021	Completato
Scoping e consultazioni con le autorità ambientali	Giugno - Ottobre 2021	Completato
Bozza del Rapporto Ambientale	Novembre 2021-Marzo 2022	Completato
Revisione interna della Bozza di Rapporto Ambientale e coordinamento con il team di Programmazione	Marzo 2022	Completato
Bozza finale del Rapporto Ambientale	Marzo 2022	Completato
Approvazione della bozza finale del Rapporto Ambientale da parte delle Autorità Ambientali	Aprile 2022	In corso
Consultazioni delle Autorità Ambientali responsabili e dei cittadini sul Rapporto Ambientale	Maggio 2022	-
Documentazione delle consultazioni e Rapporto Ambientale finale	Giugno 2022	-
Dichiarazione ambientale	Dopo adozione IP	-
Fine prevista del processo	Giugno - Luglio 2022	-

Conclusioni del processo di scoping

Il processo di scoping che ha coinvolto tutte le autorità ambientali responsabili dell'area del programma è stato avviato nel giugno 2021. Durante lo scoping sono stati riconosciuti gli impatti prevalentemente positivi dell'IP sull'ambiente, con tre punti di criticità o potenziali impatti negativi esposti:

- maggiori pressioni sull'ambiente dovute all'aumento del turismo;
- potenziale impatto negativo delle nuove infrastrutture di piccola scala;
- impatti potenzialmente negativi sugli elementi materiali e immateriali del patrimonio culturale e naturale.

In entrambi i Paesi è stata svolta una procedura di scoping scritta e in Slovenia è stato organizzato anche un seminario on-line. Sulla base delle risposte e dei commenti ricevuti, è stata preparata la versione finale dello Scoping Report nell'ottobre 2021. Il team di VAS ha utilizzato gli input della procedura di scoping per definire gli obiettivi ambientali del Report Ambientale e gli indicatori utilizzati per valutare gli impatti dell'IP sull'ambiente.

Aspetti ambientali, questioni e criticità

Sulla base delle conclusioni dello scoping, tutti gli aspetti ambientali e tutti i problemi e le criticità ambientali individuate sono stati oggetto della valutazione della VAS. L'analisi dei quadri delle politiche ambientali a livello internazionale e nazionale ha portato alla definizione delle seguenti problematiche e criticità ambientali.

ASPETTI AMBIENTALI	QUESTIONI E CRITICITA' AMBIENTALI
Aria	Inquinamento dell'aria
Clima	Mitigazione dei cambiamenti climatici (riduzione delle emissioni di gas serra, energie rinnovabili, efficienza energetica)
	Adattamento ai cambiamenti climatici (capacità di adattamento e misure di adattamento)
Acqua	Protezione e ripristino degli ecosistemi acquatici e delle zone umide
	Pressioni sull'idromorfologia
	Pressioni relative all'inquinamento delle acque superficiali anche in relazione alla salute umana
	Pressioni relative all'inquinamento delle acque sotterranee anche in relazione alla salute umana
	Prelievo di acqua e relative pressioni sui corpi idrici superficiali e sotterranei
Suolo e uso del suolo	Garantire un uso sostenibile di terra e suolo
	Prevenzione perdita di suolo e prevenzione inquinamento del suolo
Biodiversità e Natura 2000	Tutela e conservazione della biodiversità e degli ecosistemi naturali
	Tutela e conservazione delle specie e degli habitat Natura 2000
	Promozione di infrastrutture verdi e gestione ecosistemica delle risorse naturali
Patrimonio culturale	Tutela e conservazione del patrimonio culturale
	Promozione della gestione partecipata del patrimonio culturale
Paesaggio	Tutela e conservazione del paesaggio
	Tutela e valorizzazione della geodiversità e del patrimonio geologico
Popolazione e salute umana	Impatti dell'inquinamento acustico sulla salute umana e sul benessere
	Rifiuti solidi e pericolosi
	Salute pubblica e salute ambientale
	Impatti dei cambiamenti climatici (alluvioni) sulla salute umana e sul benessere
	Impatti dell'inquinamento acustico sulla salute umana e sul benessere

Questo elenco è stato utilizzato come base per la preparazione dello stato dell'ambiente nell'area, nonché per le valutazioni ambientali della "alternativa zero" (ZA) e del Programma.

Lo stato attuale dell'ambiente e l'alternativa zero

Il team VAS ha fatto affidamento su dati pubblici, rapporti di monitoraggio e propri GIS e analisi statistiche per descrivere lo stato attuale dell'ambiente e la tendenza dell'Alternativa Zero (ZA) per i singoli aspetti ambientali. L'analisi si è concentrata su indicatori chiave pre-identificati, utilizzati in seguito anche nel processo di valutazione dell'impatto potenziale.

ASPETTI AMBIENTALI	INDICATORI	ANDAMENTO DELLO STATO DELL'AMBIENTE E DELL'ALTERNATIVA ZERO	
		ITALIA	SLOVENIA
Aria	Livelli medi di emission dei principali inquinanti dell'aria (NOx, PM10, PM2,5, O3, SO2)	↗ ↔	↗ ↔
Clima	Emissioni gas serra	↘ ↔	↗
	Quota di energia rinnovabile in relazione al consumo lordo totale di energia	↔	↗
	Consumo totale di energia	↗	↗
Acque	Stato ecologico e chimico delle acque di superficie	↘ ↔	↘ ↔
	Stato chimico delle acque dei corsi sotterranei	↔	↔
	Stato quantitativo delle acque sotterranee	↔	↔
	Indice di sfruttamento dell'acqua	↔	↔
Suolo	Consumo di suolo	↘	↘
	Uso del suolo/cambiamento della copertura del suolo per categorie	↘	↘
	Area of functionally de-graded areas	↘	↘
	Qualità del suolo e inquinamento del suolo	↘	↔
Biodiversità	Sviluppo delle aree naturali protette (per categorie)	↔	↗
	Condizioni favorevoli per le specie di interesse europeo	↘	↘
	Condizioni favorevoli di specie di interesse europeo	↗	↗
Paesaggio e patrimonio culturale	Elementi del patrimonio culturale registrati	↗	↘
	Patrimonio culturale intangibile	↗	↘
	Estensione dei paesaggi protetti	↗	↗
	Rischio di abbandono dei terreni agricoli	↔	↘
	Frammentazione del paesaggio	↘	↘
Salute e benessere umani	Popolazione esposta a inquinamento dell'aria	↗ ↔	↗
	Popolazione esposta a inquinamento acustico	↔ ↘	↗
	Rifiuti solidi pro-capite prodotti	↘	↘
	Rifiuti solidi differenziati	↗	↗
	"Personale equivalente" per migliaia di "pazienti equivalenti"	↔ ↘	↘
	Popolazione esposta al rischio alluvioni	↔ ↘	↗

Tendenza della Stato dell'Ambiente e alternativa zero (ZA) previsione sviluppo:
↑ Miglioramento; ↗ Parziale o graduale miglioramento; ↔ Nessun cambiamento; ↘ Parziale o graduale peggioramento; ↓ Peggioramento

Identificazione e valutazione degli impatti

Gli impatti potenziali individuate nella fase di Scoping sono stati recuperati, descritti e definiti in maniera più precisa. La conclusione a cui si è giunti è che il Programma contribuirà con molti impatti positivi su tutti gli aspetti ambientali considerati. Ciononostante, sono stati individuati anche i seguenti potenziali impatti negativi:

- Incremento nei livelli di inquinamento dell'aria e aumento dei rischi per la salute umana in ragione dell'accrescimento nell'emissione di inquinanti (CO, NMVOC, NOx, PM10, PM2.5)

conseguenti all'aumento dei flussi di traffico, soprattutto nelle aree turistiche.
- Incremento delle pressioni sull'ambiente a causa dell'incremento e la dispersione dei flussi turistici (maggiore consumo di energia, accresciuti flussi turistici, perdita e impermeabilizzazione del suolo, maggiore produzione di rifiuti e inquinamento delle acque, aumento del consumo di risorse naturali, distruzione di flora e fauna nelle aree protette e nei siti Natura 2000).
- Potenziale impatto negativo di nuove infrastrutture (perdita e impermeabilizzazione del suolo, danni all'idro-morfologia delle acque superficiali, frammentazione)
- Impatti diversi sugli attributi tangibili e intangibili del patrimonio culturale e naturale, conseguenti agli accresciuti flussi turistici ed alla richiesta connessa di infrastrutture e servizi turistici.

Come risulta evidente dalla panoramica fornita dalla tabella seguente, il programma è orientato verso lo sviluppo sostenibile e la ricerca di soluzioni progettuali *green*. Inoltre, visto che tutti i progetti e le potenziali azioni a "carattere di investimento" devono essere realizzati in linea con la legislazione e le norme di carattere nazionale e regionale, non è previsto alcun impatto negativo significativo, nemmeno nel peggior caso/scenario possibile di attuazione del Programma. Gli effetti transfrontalieri del programma risultano essere esclusivamente positivi.

OBIETTIVI SPECICI DEL PROGRAMMA	ASPETTI AMBIENTALI													
	Aria		Clima			Acque		Suolo e uso del suolo		Biodiversità		Paesaggio		Salute della pop	
SO 1.1	0		+1			0		+1		0		0		+1	
SO 2.4	0		+2	T+		+1	-1	+1	-1	+1	-1	+1	-1	+2	T+
SO 2.6	+1		+1			+1		+1		+1		+1		+1	
SO 2.7	+2		+1			+1	T+	+1		+2		+2		+2	
SO 4.6	+1	-1	+2	-1	T+	+1	-1	-1		+2	-1	+2	-1	+2	-1
ISO 1b	+1	T+	+1			0		0		0		0		+1	T+
ISO 1c	0		0			0		0		0		+1		+1	

Nessun impatto negativo significativo è stato identificato nella VAS per nessuno dei sette SO del Programma; sono stati individuati solo impatti negativi non significativi per due dei sette SO. Inoltre, l'intero Programma pone una forte enfasi sul miglioramento dell'attuale situazione ambientale e affronta questioni chiave in riferimento all'ambiente e alla sostenibilità.

Per tali impatti negativi non significativi sono state previste le misure di mitigazione, oltre a raccomandazioni per l'ulteriore miglioramento degli impatti positivi individuati dal Programma. Molte di queste ultime sono già state considerate e integrate nel programma, come descritto nella Sezione 1.5 del Rapporto Ambientale. quelle che rimangono invece da considerare sono:

Misure di mitigazione proposte	SO/Aspetti ambientali obiettivo
Incoraggiare l'utilizzo dell'approccio "Sustainable by Design" nella selezione dei progetti relativi agli obiettivi SO 2.4 e 4.6[1]. I richiedenti devono essere chiamati a spiegare nella candidatura se e come le azioni previste dal progetto tengono conto dell'aumento potenziale dei flussi turistici, l'aumento della sostenibilità dell'offerta turistica o il contributo alla riduzione dell'impronta di carbonio dei prodotti/servizi turistici previsti (ad es., nuovi prodotti/servizi turistici basati su soluzioni sostenibili di mobilità o sul trasporto pubblico, sforzo sistemico nella riduzione/ottimizzazione dei flussi turistici, ecc…), così come l'uso efficiente e sostenibile delle risorse naturali o il contributo alla rigenerazione dell'ambiente e dei servizi ecosistemici – in una sezione dedicata del formulario di candidatura del progetto. Di conseguenza, il Programma dovrebbe favorire e co-finanziare gli interventi che prevedono soluzioni progettuali sostenibili.	2,4 e 4.6 *Aria, Clima, Acque, Suolo, Biodiversità e patrimonio naturale, Paesaggio e patrimonio culturale, Popolazione e salute umana*
Considerare e valutare l'impatto degli elementi infrastrutturali presenti nel progetto strategico ADRIONCYCLETOUR sul sistema idraulico locale.	4.6 *Acque*

Misure e raccomandazioni di miglioramento proposte	SO/Aspetti ambientali obiettivo
Incoraggiare la considerazione dei collegamenti potenziali esistenti tra le azioni previste da ISO	4.6 e ISO 1b

[1] In linea con gli obiettivi del Green Deal, il Sustainable by design è un approccio di progettazione sistemica per integrare sicurezza, circolarità e funzionalità di prodotti e processi durante tutto il loro ciclo di vita.

1b (trasporti multimodali non urbani) e SO 4.6 (ADRIONCYCETOUR).	*Aria, Clima*
Le azioni seguenti possono essere aggiunte a SO 2.6 (o a qualunque altro SO, se considerato più adatto dal gruppo di progetto del Programma): **"Promuovere reti di attività che incorporino i temi della mitigazione e dell'adattamento al cambiamento climatico assieme ad altri rilevanti fattori ambientali) nell'insieme esistente di attività commerciali e nel processo decisionale aziendale (ad es. nello sviluppo dei prodotti, ecc…)"**	2.6 *Clima*

Alla luce di tutte le considerazioni precedenti, la conclusione finale del presente Rapporto Ambientale è che gli impatti sull'ambiente derivanti dall'attuazione del Programma Interreg Italia-Slovenia 2021-2027 saranno positivi in maniera preponderante, e che i non significativi impatti negativi possono essere limitati dalla misure di mitigazione proposte.

È stata realizzata anche la Valutazione d'Incidenza Ambientale (VINCA) come parte integrante del processo di VAS del Programma Interreg Italia-Slovenia 2021-2027. L'indicazione principale proveniente da essa è il riconoscimento che nessuno degli obiettivi o delle azioni del Programma risultano incompatibili con gli obiettivi delle Direttive Habitat e Uccelli. Per maggiori elementi sul processo di VINCA e i suoi risultati, si faccia riferimento all'Appendice 1 a questo Rapporto Ambientale.

Proposta di monitoraggio

Poiché la VAS non ha individuato impatti negativi significativi per nessuno dei sette SO del programma, nessuna misura di monitoraggio deve essere obbligatoriamente applicata.

Tuttavia, allo scopo di misurare l'avanzamento dell'impatto del Programma e di assicurarne la coerenza con le valutazioni della VAS, si raccomanda una serie di misure di monitoraggio in relazione agli aspetti più sensibili e interessati, ovvero:

- Numero di studi sulla capacità di carico delle aree protette, realizzati nell'ambito dei progetti finanziati.
- Numero di piani di gestione del flusso di visitatori nelle aree protette, realizzati nell'ambito dei progetti finanziati.
- Numero di nuovi prodotti/servizi/attività di turismo sostenibile, sviluppati nell'ambito dei progetti finanziati.
- Numero di strategie di accessibilità/mobilità sostenibile rivolta ai turisti come gruppo *target*, sviluppati nell'ambito dei progetti finanziati.

Si raccomanda inoltre che il monitoraggio degli effetti ambientali potenziali sia riflesso idealmente attraverso la modalità del ciclo di progetto, come esposto in dettaglio nel Capitolo 8 del Rapporto Ambientale.

Valutazione del principio dell'assenza di danni significativi (DNSH)

Il principio DNSH è finalizzato ad assicurare che i Fondi di Coesione supportino attività e investimenti in linea con le soglie e gli obiettivi ambientali e climatici dell'Unione Europea, chiedendo di valutare il grado di pericolosità delle azioni e degli investimenti previsti in riferimento a sei ambiti:

1. Mitigazione del cambiamento climatico;
2. Adattamento al cambiamento climatico;
3. Qualità delle acque dolci e marine;
4. Economia circolare, con attenzione al tema della riduzione dei rifiuti e del riciclo;
5. Inquinamento di aria, suoli e acque;
6. Protezione della biodiversità.

Il Rapporto Ambientale si fa carico del principio del DNSH, dando visibilità alle correlazioni esistenti all'interno del Rapporto stesso con i sei ambiti precedenti.

Seguendo le Linee Guida Nazionali Italiane e considerando gli aspetti specifici evidenziati nella VAS,

è stata riscontrata una sostanziale conformità del programma con il principio DNSH: in due soli SO su sette, tale conformità è inferiore al 100%. Si tratta del SO 2.4, con un grado di conformità che va dall'80% per la biodiversità al 90% per le acque, e del SO 4.6 (mai completamente conforme, variando dal 75% per Inquinamento e Qualità delle acque all'85% della Biodiversità).

	SO 1.1	SO 2.4	SO 2.6	SO 2.7	SO 4.6	ISO 1b	ISO 1c
1. Clima – Mitigazione	100%	100%	100%	100%	80%	100%	100%
2. Clima – Adattamento	100%	100%	100%	100%	80%	100%	100%
3. Acque	100%	90%	100%	100%	75%	100%	100%
4. Economia circolare	100%	100%	100%	100%	80%	100%	100%
5. Inquinamento	100%	85%	100%	100%	75%	100%	100%
6. Biodiversità	100%	80%	100%	100%	85%	100%	100%

La lista delle misure proposte per ripristinare la conformità al 100% sono le stesse misure di mitigazione previste dalla VAS, ovvero il suggerimento a tutti i candidati nell'ambito del SO 4.6 all'utilizzo dell'approccio "Sustainable by Design" nella progettazione e la richiesta di precisa illustrazione dell'impatto potenziale sugli aspetti ambientali locali della eventuale realizzazione di infrastrutture nell'ambito del progetto ADRIONCYCLETOUR.

Poljudni povzetek

To poglavje povzema rezultate in zaključke procesa CPVO izvedenega za Program Interreg VI-A Italija-Slovenija 2021-2027.

Podrobnejše obrazložitve so predstavljene v posameznih poglavjih okoljskega poročila.

Opis programa

Program Interreg VI-A Italija-Slovenija 2021-2027 (v nadaljevanju IP) je program, ki se pripravlja v okviru Evropskega Teritorialnega Sodelovanja (ETS) in je financiran s strani Evropskega sklada za regionalni razvoj. Namen tovrstnih čezmejnih programov je zagotoviti podporo državam članicam EU pri izvajanju skupnih projektov ter naslavljanju in premagovanju skupnih oz. čezmejnih izzivov.

Programsko območje pokriva 19.841 km^2, na njem pa živi približno 3 milijone prebivalcev. Obsega 5 NUTS 3 regij na italijanski strani (Benetke, Videm, Pordenone, Gorica in Trst) in 5 NUTS 3 regij na slovenski strani (Primorsko-notranjska, Osrednjeslovenska, Gorenjska, Obalno-kraška and Goriška).

IP naslavlja naslednjih šest ključnih vsebinskih področij z namenom izboljšanja življenjskih pogojev za vse deležnike in prebivalce programskega območja:

1. Raziskave in inovacije;
2. Energija, klimatske spremembe in trajnostni razvoj;
3. Trg dela, človeški kapital, manjšine, zdravstvo;
4. Povezljivost in promet;
5. Naravna in kulturna dediščina ter turizem;
6. Upravljanje.

Prioritete (P) in specifični cilji (SC) so, skupaj z viri financiranja, predstavljeni v spodnji preglednici:

Prioritete	Specifični cilji	Finančni okvir
P 1 – Konkurenčnejša in pametnejša Evropa	**SC 1.1** - Razvoj in izboljšanje raziskovalne in inovacijske zmogljivosti ter uvajanje naprednih tehnologij	€ 6.439.065,00 (9,7%)
P 2 – Bolj zelena, nizkoogljična Evropa, ki je odporna in prehaja na gospodarstvo z ničelnim ogljičnim odtisom	**SC 2.4** - Spodbujanje prilagajanja podnebnim spremembam in preprečevanja tveganja nesreč ter odpornosti, ob upoštevanju ekosistemskih pristopov	€ 9.342.721,00 (14,1%)
	SC 2.6 - Spodbujanje prehoda na krožno gospodarstvo, gospodarno z viri	€ 5.294.208,00 (8,0%)
	SC 2.7 - Izboljšanje varstva in ohranjanja narave ter biotske raznovrstnosti in zelene infrastrukture, tudi v mestnem okolju, in zmanjšanje vseh oblik onesnaževanja (vključuje tudi strateški projekt POSEIDONE)	€ 10.171.344,00 (15,4%)
P 4 - Bolj socialna in vključujoča Evropa	**SC 4.6** - Krepitev vloge kulture in trajnostnega turizma pri gospodarskem razvoju, socialni vključenosti in socialnih inovacijah (vključuje tudi strateška projekta ADRIOCYCLETOUR in drugi za skupno upravljanje in trajnostni razvoj Klasičnega Krasa)	€ 29.853.250,00 (45,0%)
ISC 1 – Boljše upravljanje sodelovanja	**ISC 1 (b) -** Krepitev učinkovite javne uprave s spodbujanjem pravnega in upravnega sodelovanja ter sodelovanja med državljani, akterji civilne družbe in institucijami, zlasti z namenom, da se odpravijo pravne in druge ovire v obmejnih regijah	€ 3.659.845,00 (5,5%)
	ISC 1 (c) - Krepitev medsebojnega zaupanja, zlasti s spodbujanjem ukrepov v zvezi s projekti povezovanja med ljudmi	€ 1.500.000,00 (2,3%)
Total		***€ 66.260.433,00 (100,0%)***

Za doseganje sinergij med strateškimi in navadnimi projekti bo potrebna koordinacija Programa Interreg VI-A Italija-Slovenija 2021-2027 z ostalimi obstoječimi makro-regionalnimi strategijami, kot sta EUSALP in EUSAIR. IP prav tako izkazuje komplementarnost in potencial za izkoriščanje možnih sinergij z ostalimi finančnimi okvirji in programi kot so Evropski zeleni dogovor, Alpski prostor, Adrion, Italija-Slovenija, Slovenija-Hrvaška, ipd.

IP se zavezuje k spoštovanju horizontalnih principov kot jih določa Listina EU o temeljnih pravicah vključno z enakostjo spolov, ne-diskriminacijo, dostopnostjo in trajnostnim razvojem v pripravi, implementaciji, monitoringu, poročanju in evalvaciji projektov. Prav tako se zavezuje k upoštevanju Kazalnikov ciljev trajnostnega razvoja ZN, uresničevanju Pariškega dogovora in principa »da se ne škoduje bistveno«.

Podrobnejša obrazložitev IP je predstavljena v poglavju 1 okoljskega poročila.

Metodološki pristop, alternative in proces CPVO

Okoljsko poročilo je pripravljeno v skladu z Direktivo EU 2001/42/EC in SEA Protokolom. Okvir vrednotenja temelji na obravnavi ključnih delov okolja, kot jih določa SEA Direktiva, in posledično prepoznanimi ključnimi okoljskimi cilji ter vprašanjem na kakšen način jih IP naslavlja.

Vsebina IP je bila v okviru programiranja dogovorjena v okviru nacionalnih delegacij obeh držav in predstavlja dogovor o tem kako program naslavlja ključne potrebe programskega območja na učinkovit način v okviru razpoložljivega finančnega okvirja. Posledično v fazi CPVO programske alternative, ki bi jih okoljsko poročilo obravnavalo ne obstajajo več, saj so bile iz drugih razlogov že izločene. Obenem pa ne-izvedba programa (oz. t.i. »ničelne alternative«) ni prav zelo verjetna. Če bi do ne-izvedbe programa vseeno prišlo bi se vsi obstoječi okoljski trendi nadaljevali – ob tem seveda tako do pozitivnih, kot negativnih vplivov programa na okolje prav tako ne bi prišlo.

Namen procesa CPVO je bil na eni strani preko priporočil in spodbujevalnih ukrepov okrepiti že tako okoljsko naravnano vsebino programa, na drugi strani pa preko omilitvenih ukrepov omiliti prepoznane negativne vplive programa. Tako eni kot drugi bi namreč lahko vodili v preoblikovanje že obstoječih programskih aktivnosti, ali pa bili oblikovani v dodatne aktivnosti programa.

Vplivi izvedbe IP na opredeljene okoljske cilje so bili vrednoteni na podlagi sprememb meril, ki so bila postavljena za spremljanje doseganja posameznega okoljskega cilja, na oceni ustreznosti stopnje s katero program naslavlja določeno okoljsko problematiko ter na drugih relevantnih merilih.

Potencialni vplivi programa prepoznani v fazi vsebinjenja so bili v okoljskem poročilu podrobneje opredeljeni in vrednoteni na podlagi naslednje lestvice vrednotenja:

+2	+1	0	-1	-2	T+	T-
Bistven pozitiven vpliv	Nebistven pozitiven vpliv	Omejen vpliv oz. vpliva ni	Nebistven negativen vpliv	Bistven negativen vpliv	Čezmejni pozitiven vpliv	Čezmejni negativen vpliv

Na podlagi vrednotenja so bili opredeljeni omilitveni oz. spodbujevalni ukrepi in priporočila. Izdelovalci okoljskega poročila so bili v proces programiranja vključeni v zgodnji fazi, kar jim je omogočilo vzpostavitev tesnega in konstruktivnega sodelovanja z vsemi deležniki. Sodelovali so tudi na sestankih delovne skupine. Posledično so lahko v procesu programiranja v ključnih trenutkih tudi tvorno sodelovali in s tem vplivali na vsebino IP.

Na podlagi navedenih aktivnosti lahko potrdimo, da je bilo znatno število priporočil in omilitvenih ukrepov že v fazi programiranja integriranih v končni osnutek IP (verzija 5 končnega osnutka IP, datirana na dan 31. 3. 2022). S tem pa je bila potrjena dodana vrednost CPVO za celoten proces programiranja.

Navkljub navedenemu se je treba zavedati, da okoljsko poročilo predstavlja le enega od korakov v procesu CPVO:

Koraki procesa CPVO	Datum	Status
Uvodni sestanek	December 2020	Zaključeno
Integracija procesa CPVO v proces programiranja	Januar-maj 2021	Zaključeno
Vsebinjenje in posvetovanje s pristojnimi institucijami	Junij-oktober 2021	Zaključeno
Osnutek okoljskega poročila	November 2021- marec 2022	Zaključeno
Notranja revizija osnutka okoljskega poročila in koordinacija z načrtovalci	Marec 2022	Zaključeno
Okoljsko poročilo	Marec 2022	Zaključeno
Pridobitev mnenja o ustreznosti okoljskega poročila s strani pristojnih institucij	April 2022	V izvajanju
Javna razgrnitev in obravnava okoljskega poročila (vključno s čezmejnim posvetovanjem)	Maj 2022	-
Dopolnitev okoljskega poročila po javni razgrnitvi in obravnavi	Junij 2022	-
Okoljska izjava	Po sprejemu IP	-
Pričakovani zaključek procesa	Junij-julij 2022	-

Zaključki vsebinjenja

V proces vsebinjenja, ki se je pričel v juniju 2021, so bile vključene vse pristojne institucije na

programskem območju. V procesu so bili prepoznani predvsem pozitivni vplivi na okolje, ob tem pa so bili izpostavljeni tudi trije potencialni negativni vplivi na okolje:

- Povečani pritiski na okolje zaradi povečanja turističnega obiska;
- Potencialni negativni vplivi zaradi postavitve male infrastrukture;
- Potencialni negativni vplivi na snovno in nesnovno kulturno in naravno dediščino.

V obeh državah je bilo vsebinjenje izvedeno v dopisni obliki, v Sloveniji pa je bila izvedena tudi spletna delavnica. Na podlagi pridobljenih odzivov in pripomb je bilo v oktobru 2021 pripravljeno poročilo o vsebinjenju. Na podlagi zaključkov vsebinjenja je izdelovalec okoljskega poročila definiral okoljske cilje in indikatorje na katerih je temeljilo vrednotenje vplivov izvedbe IP na okolje podano v okviru okoljskega poročila.

Okoljske vsebine, problemi in izzivi

V okviru vrednotenja je bilo določeno, da se v okoljskem poročilu obravnavajo vse okoljske vsebine in vsi identificirani okoljski izzivi. Na podlagi pregleda mednarodnih politik in nacionalnih zakonodaj so bili opredeljeni naslednji okoljski problemi in izzivi.

OKOLJSKE VSEBINE	OKOLJSKI PROBLEMI IN IZZIVI
Zrak	Onesnaževanje zraka
Klimatske razmere	Klimatske spremembe - blaženje (toplogredni plini, obnovljivi viri energije, energetska učinkovitost)
	Klimatske spremembe – prilagajanje (sposobnost prilagajanja in prilagoditveni ukrepi)
Vode	Varovanje in obnova vodnih ekosistemov in mokrišč
	Hidromorfološki pritiski
	Onesnaževanje površinskih voda in povezava z zdravjem ljudi
	Onesnaževanje podzemnih voda in povezava z zdravjem ljudi
	Pritiski povezani s črpanjem površinskih in podzemnih voda
Prst in raba tal	Zagotavljanje trajnostne rabe tal in prsti
	Preprečevanje izgube in onesnaževanja prsti
Biodiverziteta in Natura 2000	Varovanje in ohranjanje biodiverziteta in naravnih ekosistemov
	Varovanje in ohranjanje Natura 2000 vrst in habitatov
	Promocija zelene infrastrukture in na ekosistemih temelječega upravljanja
Prebivalstvo in zdravje ljudi	Vplivi onesnaževanja s hrupom na zdravje ljudi in kakovost bivanja
	Komunalni in nevarni odpadki
	Zdravje ljudi in zdravo življenjsko okolje
	Vplivi podnebnih sprememb (poplav) na zdravje ljudi in kakovost bivanja
	Vplivi onesnaževanja s hrupom na zdravje ljudi in kakovost bivanja
Kulturna dediščina	Varovanje in ohranjanje kulturne dediščine
	Promocija participativnega upravljanja kulturne dediščine
Krajina	Varovanje in ohranjanje krajine
	Varovanje in valorizacija geodiverzitete in geološke dediščine

Navedeni seznam je predstavljal osnovo za pripravo analize stanja okolja in določitev trendov t.i. ničelne alternative oz. ne-izvedbe programa.

Stanje okolja in ničelna alternativa

Za potrebe priprave okoljskega poročila so bili uporabljeni javno dostopni podatki, uradna poročila spremljanja stanja okolja ter lastne GIS in statistične analize stanja okolja in trendi posameznih okoljskih vsebin. Analiza je temeljila na vnaprej določenih indikatorjih stanja okolja, ki so bili kasneje uporabljeni tudi za vrednotenje.

OKOLJSKE VSEBINE	INDIKATORJI	STANJE OKOLJA IN TRENDI V PRIMERU NE-IZVEDBE PROGRAMA	
		ITALIJA	SLOVENIJA
Zrak	Povprečne emisijske vrednosti ključnih onesnaževal (NOx, PM10, PM2,5, O3, SO2)	↗ ↔	↗ ↔
Klimatske razmere	Emisije toplogrednih plinov	↘ ↔	↗
	Delež uporabe obnovljivih virov energije v končni rabi energije	↔	↗
	Končna raba energije	↗	↗
Vode	Ekološko in kemično stanje površinskih voda	↘ ↔	↘ ↔
	Kemično stanje podzemnih voda	↔	↔
	Količinsko stanje podzemnih voda	↔	↔
	Indeks porabe vode	↔	↔
Prst	Urbanizacija tal	↘	↘
	Sprememba rabe tal po kategorijah	↘	↘
	Površina funkcionalno degradiranih območij	↘	↘
	Kakovost prsti in onesnaženost prsti	↘	↔
Biodiverziteta	Zavarovana in varovana območja narave (po kategorijah)	↔	↗
	Ugodno stanje vrst	↘	↘
	Ugodno stanje habitatov	↗	↗
Zdravje ljudi in kakovost bivanja	Število ljudi izpostavljenih onesnaženju zraka	↗ ↔	↗
	Število ljudi izpostavljenih prekomernim obremenitvam s hrupom	↔ ↘	↗
	Proizvedeni komunalni odpadki na prebivalca	↘	↘
	Ločeno zbrani komunalni odpadki	↗	↗
	Število medicinskega osebja na tisoč prebivalcev	↔ ↘	↘
	Število ljudi izpostavljenih poplavam	↔ ↘	↗
Krajina in kulturna dediščina	Registrirane enote kulturne dediščine	↗	↘
	Nesnovna kulturna dediščina	↗	↘
	Varovane krajine	↗	↗
	Nevarnost opuščanja kmetijskih dejavnosti	↔	↘
	Fragmentiranost krajine	↘	↘

Stanje okolja in trendi v primeru ne-izvedbe programa:
↑ Trend izboljšanja; ↗ Delno ali počasi izboljšujoči se trend; ↔ Nespremenjen trend; ↘ Delno ali počasi slabšajoči se trend ↓ Trend poslabšanja

Identifikacija in vrednotenje vplivov na okolje

Potencialni vplivi na okolje, identificirani v vsebinjenju, so bili podrobneje proučeni in opredeljeni. Ugotovljeno je bilo, da bi izvedba programa prinesla predvsem pozitivne vplive na okolje. Kljub navedenemu, pa je vrednotenje opozorilo na naslednje negativne vplive na okolje:

- Povečanje onesnaževanja zraka in posledično povečanega vpliva na zdravje ljudi zaradi povečanih emisijskih vrednosti ključnih onesnaževal (NOx, PM_{10}, $PM_{2,5}$, O_3, SO_2) iz naslova povčanih prometnih tokov, še posebej v turističnih območjih.
- Povečani pritiski na različne dele okolja zaradi povečanih in razširjenih turističnih tokov (povečana praba energije, povečani prometni tokovi, izguba tal, povečano nastajanje odpadkov, povečana poraba vode in onesnaževanje voda, povečana raba naravnih virov, motnje flore in favne v zavarovanih območjih inj območjih Natura 2000).
- Potencialni negativni vpliv vzpostavitve nove infrastrukture (izguba tal, povečanje hidromorfoloških pritiskov na površinske vode, fragmentacija).
- Raznovrstni vplivi na elemente snovne in nesnovne kulturne in naravne dediščine zaradi povečanega turističnega obiska ter z njim povečanja potrebe po tursitični infrastrukturi ter novih tursitičnih proizvodih/storitvah.

Vplivi izvedbe IP na opredeljene okoljske cilje so bili vrednoteni na podlagi sprememb meril, ki so

bila postavljena za spremljanje doseganja posameznega okoljskega cilja, na oceni ustreznosti stopnje s katero program naslavlja določeno okoljsko problematiko ter na drugih relevantnih merilih.

Kot je razvidno iz spodaj podanih ocen, je program zelo očitno usmerjen v zagotavljanje trajnostnega razvoja in podpori projektov v smeri zelenih rešitev. Glede na to, da morajo biti vsi projekti in aktivnosti »investicijskega značaja« izvedeni skladno z veljavno zakonodajo in standardi, okoljsko poročilo ni prepoznalo bistvenih negativnih vplivov tovrstnih projektov, tudi v primeru realističnega/najslabšega možnega scenarija. Čezmejni vplivi programa so izključno pozitivne narave.

SPECIFIČNI CILJI IP	OKOLJSKE VSEBINE													
	Zrak		Klimatske razmere			Vode		Prst in raba tal		Biodiverziteta		Krajina in kulturna dediščina		Prebivalstvo in zdravje ljudi	
SC 1.1	0		+1			0		+1		0		0		+1	
SC 2.4	0		+2	T+		+1	-1	+1	-1	+1	-1	+1	-1	+2	T+
SC 2.6	+1		+1			+1		+1		+1		+1		+1	
SC 2.7	+2		+1			+1	T+	+1		+2		+2		+2	
SC 4.6	+1	-1	+2	-1	T+	+1	-1	-1		+2	-1	+2	-1	+2	-1
ISC 1b	+1	T+	+1			0		0		0		0		+1	T+
ISC 1c	0		0			0		0		0		+1		+1	

Vrednotenje vse 7 specifičnih ciljev ni prepoznalo nobenega bistvenega negativnega vpliva programa na okolje, ob tem pa opozorilo na nebistven negativni vpliv dveh od sedmih specifičnih ciljev. Obenem je prepoznalo, da program polaga veliko pozornosti na naslavljanje izzivov, ki izhajajo iz obstoječega stanja okolja.

Za prepoznani nebistveni negativni vpliv dveh specifičnih ciljev so bili predlagani omilitveni ukrepi, za dodatno izboljšanje prepoznanih pozitivnih vplivov izvedbe programa pa dodatna priporočila. Številna so bila že v toku programiranja vključena v vsebino programa, kar je podrobneje opisano v poglavju 1.5. Preostali omilitveni ukrepi in priporočila so:

Predlagani omilitveni ukrepi	Ciljani SC / Okoljske vsebine
Program naj preko ustrezno zasnovanega načina izbora projektov vzpodbudi vse prijavitelje projektov v okviru SC 2.6 in 4.6, da »okoljsko trajnost« vgradijo oz. upoštevajo že v zasnovi projekta. Prijavitelji naj že v prijavi projekta pojasnijo če in kako njihov projekt naslavlja vprašanje povečanja turističnih tokov, izboljšavo turistične ponudbe in/ali prispeva k zmanjšanju ogljičnega odtisa njihovih turističnih produktov/storitev (npr. novi turistični produkti/storitve temelječe na trajnostni mobilnosti in/ali javnemu prometu, sistemski ukrepi za zmanjšanje turističnih tokov, itd.), učinkovitejši rabi naravnih virov ali prispeva k regeneraciji okolja in ekosistemskih storitev – na primer že v okviru prijavne dokumentacije. Posledično naj program prioritetno podpre izvedbo projektov, ki zgoraj navedeno lahko ustrezno dokažejo.	2,4 in 4.6 *Zrak* *Klimatske razmere* *Vode* *Prst* *Biodiverziteta* *Zdravje ljudi in kakovost bivanja* *Krajina in kulturna dediščina*
Proučiti in ovrednotiti vpliv infrastrukture predvidene v okviru projekta ADRIONCYCLETOUR na vode.	4.6 *Vode*

Predlagani pospeševalni ukrepi in priporočila	Ciljani SC / Okoljske vsebine
Program naj vzpodbuja prijavitelje k prepoznavi in izkoriščanju potencialnih povezav med ISO 1b (ne-urbani multimodalni promet) in SC 4.6 (ADRIONCYCETOUR).	4.6 in ISO 1b *Zrak,* *Klimatske razmere*
Naslednja aktivnost bi bila lahko dodana k SC 2.6 (ali kateremukoli drugemu SC, v kolikor ga načrtovalci smatrajo za bolj ustreznega) kot pospeševalni ukrep: »Promocija poslovnih mrež, ki blaženje in prilagajanje na podnebne spremembe (tako kot druge relevantne okoljske dejavnike) integrirajo v obstoječe poslovne operacije in korporativno odločanje (npr. razvoj novih produktov, itd.).	2.6 *Klimatske razmere*

Na podlagi vsega navedenega lahko zaključimo, da bo izvedba Programa Interreg VI-A Italija-Slovenija 2021-2027 imela predvsem pozitivne vplive na okolje, medtem ko je možno prepoznane negativne nebistvene vplive na okolje ustrezno ublažiti z izvedbo predlaganih omilitvenih ukrepov.

Presoja sprejemljivosti vplivov Programa Interreg VI-A Italija-Slovenija 2021-2027 na varovana območja narave je bila prav tako izvedena kot sestavni del okoljskega poročila. Presoja sprejemljivosti ugotavlja, da nobena od predlaganih aktivnosti programa ni v nasprotju z Direktivo o pticah in Direktivo o habitatih. Več o zaključkih presoje spremenljivosti si lahko preberete v prilogi 1 tega okoljskega poročila.

Predlagani monitoring

Glede na to, okoljsko poročilo ni prepoznalo bistvenih vplivov izvedbe Programa Interreg VI-A Italija-Slovenija 2021-2027 za nobenega od 7 strateških ciljev, opredelitev obveznega monitoringa ni potrebna.

Kljub temu, s ciljem merjenja dejanskih vplivov programa na okolje in integracije omilitvenih ukrepov v sam program, okoljsko poročilo predlaga spremljanje naslednjih kazalcev izvedbe programa:

- Število študij nosilne kapacitete zavarovanih in varovanih območij narave, izdelanih kot rezultat podprtih projektov.
- Število načrtov upravljanja z obiskovalci zavarovanih in varovanih območij narave, izdelanih kot rezultat podprtih projektov.
- Število novo razvitih trajnostnih turističnih produktov/storitev/aktivnosti, izdelanih kot rezultat podprtih projektov.
- Število strategij trajnostne mobilnosti/dostopnosti, ki kot eno od ciljnih skupin naslavljajo obiskovalce, izdelanih kot rezultat podprtih projektov.

Prav tako priporočamo, da se monitoring vplivov na okolje odraža čez celoten projektni ciklus, kot je to podrobneje opisano v poglavju št. 8.

Ocena »da se ne škoduje bistveno«

Ocena »da se ne škoduje bistveno« se izvaja s ciljem zagotoviti, da se sredstva kohezijskega sklada namenjena investicijam uporabijo skladno z okoljskimi in klimatskimi cilji in standardi EU. Ocena preverja stopnjo nevarnosti s programom predvidenih aktivnosti in investicij za šest okoljskih ciljev:

1. Blaženje podnebnih sprememb;
2. Prilagajanje na podnebne spremembe;
3. Kakovost voda in morja;
4. Krožno gospodarstvo, s poudarkom na preprečevanje nastajanja odpadkov in recikliranje;
5. Onesnaževanje zraka, prsti in voda;
6. Varovanje biodiverzitete.

Okoljsko poročilo vključuje oceno »da se ne škoduje bistveno«, s ciljem preverjanja skladnosti s programom predvidenih aktivnosti in investicij z okoljskimi cilji.

Skladno z Italijanskimi nacionalnimi smernicami in ob upoštevanju rezultatov in zaključkov okoljskega poročila, lahko ugotovimo, da je program v veliki meri skladen s principom »da se ne škoduje bistveno«, saj je le za 2 od 7 strateških ciljev ocena skladnosti nižja od 100%. Gre za strateška cilja 2.4 in 4.6. Strateški cilj 2.4 dosega oceno skladnosti med 80% za biodiverziteto in 90% za vode, medtem ko strateški cilj 4.6 ni povsem skladen z nobenim od izpostavljenih okoljskih ciljev – ocena skladnosti pa niha me 75% za onesnaževanje voda in 85% za varovanje biodiverzitete.

	SC 1.1	SC 2.4	SC 2.6	SC 2.7	SC 4.6	ISC 1b	ISC 1c
1. Blaženje podnebnih sprememb	100%	100%	100%	100%	80%	100%	100%
2. Prilagajanje na podnebne spremembe	100%	100%	100%	100%	80%	100%	100%
3. Vode	100%	90%	100%	100%	75%	100%	100%
4. Krožno gospodarstvo	100%	100%	100%	100%	80%	100%	100%
5. Onesnaževanje	100%	85%	100%	100%	75%	100%	100%
6. Biodiverziteta	100%	80%	100%	100%	85%	100%	100%

Seznam omilitvenih ukrepov za doseganje 100% skladnosti s principom »da se ne škoduje bistveno« je enak seznamu omilitvenih ukrepov, ki jih je predlagalo že okoljsko poročilo – predvsem zagotavljanje ustrezno zasnovanega načina izbora projektov, preko katerega naj se vzpodbudi vse prijavitelje projektov v okviru SC 2.6 in 4.6, da »okoljsko trajnost« vgradijo oz. upoštevajo že v zasnovi projekta ter proučitev vplivov infrastrukture predvidene v okviru projekta ADRIONCYCLETOUR na vode pred njihovo izvedbo.

1. Overview of draft Programme

Title	Interreg Italy-Slovenia 2021-2027 Programme
Version	Draft version 5, March 31st, 2022
Managing Authority	Autonomous Region Friuli Venezia Giulia, Central Directorate for Finance, Accounting Unit
Programme area	The Programme area extends over a total surface of 19,841 km^2 and has a total population of approximately 3 million inhabitants. It covers 5 Italian NUTS3 regions (Venice, Udine, Pordenone, Gorizia and Trieste) and 5 Slovenian NUTS3 regions (Primorsko-notranjska, Osrednjeslovenska, Gorenjska, Obalno-kraška and Goriška). Overall, on NUTS2 level on the Italian side, the regions involved are those of Veneto and Friuli Venezia Giulia, while for the Slovenian side Slovene Western and Eastern Cohesion Regions with their NUTS3 regions. In total five NUTS3 regions are involved on the Italian side of the border (1 in NUTS2 region Veneto and 4 in NUTS2 region Friuli Venezia Giulia) and five NUTS3 regions on the Slovenian side (1 in NUTS2 cohesion region Vzhodna Slovenija and 4 in NUTS2 cohesion region Zahodna Slovenija).

Figure 1.1: Programme area

Implementation period	2021–2027 (additional 2 years for the finalisation of funded projects)

1.1. Vision and mission of the Programme

The IP highlights six main areas where to intervene to improve the living conditions of all agents and the population of the Programme area. They are:

1. Research and Innovation;
2. Energy, Climate change and Sustainable Development;
3. Labour Market, Human Capital and Linguistic Minorities, Healthcare;
4. Connectivity and Transports;
5. Natural and Cultural heritage, and Tourism;
6. Governance.

With respect to **Research and Innovation**, the mission is to cover four main directions to support more investments in R&D and the involvement of SMEs: promoting technological upgrade and improving technological transfer to SMEs; increasing and giving continuity to investments in R&D and applied research, strengthening cooperation between R&D centers and enterprises; promoting the creation of cross border clusters; promoting capitalization of R&D results achieved at regional level in a new integrated framework taking advantage of S3 shared priorities.

In the **Energy, Climate change and Sustainable Development** field, the Programme area is facing common challenges for all Europe, while the variety of climatic zones within the area – from the Alps to the Mediterranean – confirms the need to find specific effective countermeasures. Main focal points are emissions reduction, renewable energy production, energy efficiency, and the related missions are manifold: reducing CO2 emissions by improving energy efficiency as well as by developing more sustainable mobility in line with European Green Deal objectives; improving the integration in policy making, supporting the development and use of green technologies; capitalizing on the achieved best practices and promoting the introduction and diffusion of ICT; finally, supporting actions to mitigate and adapt to the climate change depending on the territorial context-tailor-made responses for all types of landscapes and natural resources covering the whole Programme area; raising awareness and capacity building on the circular economy also capitalizing on best waste management, recycling, and water management practices.

Labour Market, Human Capital and Linguistic Minorities, and Healthcare pose the challenges of the overcoming of the pandemic situation on one hand, and of the protection and guarantees the rights of linguistic minorities on both sides of the border. Consistently, the main missions of the Programme focus on providing more territorial services pursuing accessibility and a cross-border approach. This also means promoting labour market initiatives to ensure sufficient and qualified staff in the sector and providing bilingual services in order to increase accessibility of healthcare. Changes consider the innovation too, by offering social-health services through technological solutions as telemedicine, also capitalizing on good practices from the previous programming periods. In relation to the labour market, the objectives deal with implementing integrated development strategies to promote economic recovery opportunities through ICT and circular economy (green and blue growth), creating favourable conditions to tackle specific barriers to cross-border employability, addressing ageing population needs, growth through investments in training and on supporting SMEs' competitiveness. Finally, education objectives range from the need to invest in education and training with cross-border relevance and to promote bilingualism to increase mutual understanding, boosting employability and improving bilingual services to citizens and businesses and promoting linguistic minorities.

The **Connectivity and Transports** issue is characterized by two main weaknesses, namely the lack of integration among the two national and regional systems due on one hand on the orography of the territory, on the other because transport policies depend on national strategies, which increase competition between dedicated infrastructures, rather than cooperation and interaction. Cross-border commuting is present everywhere along the border, mostly related to private transportation due to lack of public transport and non-harmonized time-schedules. The mission of the IP in this matter focuses on investing in connections with rural and coastal/hinterland areas, with flexible solutions tailored to specific territories, and on enhancing cross-border governance to improve interoperability and multimodality. This calls into question innovation through the development of e-mobility strategies and innovative mobility systems for a better accessibility of public services.

Thanks to the relevant richness in biodiversity, to the different cultural and linguistic identities and to the great number of UNESCO World Heritage Sites are located both in the Slovenian and the Italian regions of the area, **Natural and Cultural heritage, and Tourism** is one of the main topics of the Programme. Related to those, the mission of the IP is to introducing digitization to improve accessibility to the natural and cultural heritage for a wider public, enhancing green infrastructures networks and fostering shared approaches for better management and promotion of protected areas; the promotion of linguistic minorities and cultural heritage through support to creative industries and sustainable and accessible tourism; the increase of sustainable tourism flows to the peri-urban and rural areas through an integrated approach with transport, culture, education and innovation, even to overcome the impact of pandemic thanks to ethic-oriented tourism, directed to smaller/less popular destinations.

Finally, with respect to **Governance**, the cooperation experience in 2014-2020 leaves a legacy on which to build a future territorial development path. Starting with the numerous Agreements (on harmonization of territorial data, social and sanitary services for elderly, medical diagnostics, management of sanitary emergencies, port security to strengthen cooperation, energy efficiency in port areas and environmental sustainability, cross-border mobility opportunities and public transport availability on cross-border level), agreements that involved different actors at different level can be capitalized.

The mission of the IP is on one hand to foster administrative simplification in the whole cycle of policy-making, and on the other hand to consider the needs of the population and to enlarge participation and involvement to actors such as NGOs, environmental, cultural and social associations, actors able to promote and develop public-private partnerships.

1.2. Priorities

After having described the missions of the IP, we consider its priorities, which are articulated in Specific Objectives (SOs) Actions and numbered Intervention fields.

The priorities of the IP are four, elicited among the Policy Objectives (POs) of the 2021-27 Cohesion Policy. They are:

- PO 1 – A more competitive and smarter Europe by promoting innovative and smart economic transformation and regional ICT connectivity;
- PO2 - A greener, low-carbon transitioning towards a net zero carbon economy and resilient Europe by promoting clean and fair energy transition, green and blue investment, the circular economy, climate change mitigation and adaptation, risk prevention and management;
- PO4 – A more social and inclusive Europe implementing the European Pillar of Social Rights;
- ISO 1 (Interreg priority) – A better cooperation governance.

Among the previous priorities, the second one gives rise to the higher number of Specific Objectives and Actions (three), followed by the Interreg-specific priority (two), and by Priority 1 and 4 (one each). The following table proposes the logical chain of the IP from priorities to Exemplary Actions and Intervention Fields, the same chain that is the root of the SEA assessment (see Section 6).

The Interreg VI-A Italy-Slovenia 2021-27 Programme will also be committed to ensuring the respect of the horizontal principles outlined in the Charter of Fundamental Rights of the European Union including gender equality, non-discrimination, accessibility and sustainable development throughout preparation, implementation, monitoring, reporting and evaluation of projects taking into account the UN Sustainable Development Goals, the Paris Agreement and the "do no significant harm" principle. Accordingly, the selection of operations will take into account the use of Green Public Procurement, nature- based solutions, lifecycle costing criteria, standards going beyond regulatory requirements, avoiding negative environmental impacts, climate proofing and ‘energy efficiency first principle’, and so on.

Priorities	Specific Objectives	Actions	Exemplary actions	Intervention fields
PO 1	SO 1 - Developing and enhancing research and innovation capacities and the uptake of advanced technologies	Promoting a cross-border ecosystem for R&D and strengthening the innovation capacities of local actors	Developing partnerships through the approach of the quadruple helix -public bodies, enterprises, research centres and civil society- in order to stimulate knowledge sharing, open innovation strategies and the joint development of new product and services, mainly in the field of eco-innovation Promoting technology transfer processes also through the capitalisation of past experiences and the synergy with Horizon Europe valorising non-financed seal of excellence projects (rif. Art. 73.4 CPR) Building partnerships among clusters/business networks, innovation poles, business acceleration providers (incubators, accelerators) and other actors to improve their positioning (and that of the companies involved) in existing or new global value chains, taking into consideration common specialisation areas Supporting the implementation of joint pilot actions to foster innovation processes through the exploitation of new advanced technologies (e.g., nanotech, biotech, quantum tech)	010 - Research and innovation activities in SMEs, including networking 026 - Support for innovation clusters including between businesses, research organisations and PAs and business networks primarily benefiting SMEs 028 - Technology transfer and cooperation between enterprises, research centres and higher education sector
PO 2	SO4 - Promoting climate change adaptation and disaster risk prevention, resilience, taking into account ecosystem-based approaches	Fostering resilience capacity to climate change and mitigate risks related to natural disasters	Application of joint tools to counteract the effects of climate change and extreme events and to improve quality of life in the cross-border space Promoting investments for the development / strengthening / modelling of joint early warning and risk monitoring systems as well as small infrastructures for risk prevention and management, also with bio-engineering techniques Strengthening cross-border cooperation among local authorities to build up integrated risk management systems and joint action plan Design of coordinated rescue protocols and actions Promoting active awareness of risks due to anthropogenic changes and related climate changes on local ecosystems (including forest areas), in particular at local communities' level with the involvement of citizens and schools	058 - Adaptation to climate change measures and prevention and management of climate related risks: floods and landslides 059 - Adaptation to climate change measures and prevention and management of climate related risks: fires 060 - Adaptation to climate change measures and prevention and management of climate related risks: others, e.g. storms and drought 061 - Risk prevention and management of non-climate related natural risks (for example earthquakes) and risks linked to human activities (for example technological accidents)
	SO6 - promoting the transition to a circular and resource efficient economy	Developing shared model/solutions for the circular economy	Innovative and sustainable solutions for the conversion of production activities from a linear model towards a circular economy model, also capitalising past experiences/good practices Developing cross-border services based on ICT solutions in order to increase efficiency and sustainability of economic activities (logistic, delivery, mobility services, etc.) Supporting projects relating to ecosystem services (e.g., pro biodiversity business) and water management	029 - Research and innovation processes, technology transfer and cooperation between enterprises, research centres and universities, focusing on the low carbon economy, resilience and adaptation to climate change 075 -Support to environmentally-friendly production processes and resource efficiency in SMEs

			Supporting the creation of experimental supply chains in the context of the circular economy and sustainable food production, using digital technologies and artificial intelligence Developing and testing innovative technologies following the concepts of industrial symbiosis and facilitating waste reuse, as well as carbon capture, utilization or storage Exchanges of good practices for the design of new models for the optimization of the use of resources and diffusion of eco-innovations through the quadruple helix approach	
	SO7 - Enhancing protection and preservation of nature, biodiversity, and green infrastructure, including in urban areas, and reducing all forms of pollution	Conservation, protection, promotion of the cross-border area natural capital	Promoting green and blue infrastructures (for example green urban spaces, protection of ecosystems, development of ecological quality in agriculture, protection and restoration of coastal and marine biodiversity and Natura 2000 sites) Promoting, applying through pilot actions, capitalising joint strategies for the conservation and protection of biodiversity and geodiversity in the cross-border area (through the protection of habitats, the reduction of the presence of invasive species, promotion of protected areas) Preserving and restoring the natural capital of the cross-border area and promoting mitigation measures, including carrying out capacity studies and visitor management plans, in order to limit the anthropogenic pressure also linked to tourism, through inclusive actions involving public institutions, businesses, third sector organisations and citizens Promoting sustainable spatial planning, including transfer of best practices and pilot actions linked to application of sustainable spatial planning solutions aiming to preserve soil as a natural resource and ensure sustainable land use and landscape management Implementation of the strategic project POSEIDONE - Promotion Of greenSEa Infrastructure Devoted tO a New Enviroment	079 -Nature and biodiversity protection, natural heritage and resources, green and blue infrastructure
PO 4	SO 6 - enhancing the role of culture and sustainable tourism in economic development, social inclusion and social innovation	Preservation, maintenance and promotion of the cultural heritage, implementation of sustainable and innovative practices in tourism, support to education and training to foster employability and social inclusion	Preservation, revitalisation, maintenance and promotion of common tangible and intangible cultural heritage (e.g., contemporary art, language, folk culture, craftsmanship, historical heritage, architecture, literature, visual arts, music, cuisine, etc.) Supporting ECoC 2025 through the Small Project Fund Developing joint strategies, structures and communication platforms for the exchange of experience and know-how in tourism sector Implementation of the strategic project dedicated to the joint management and sustainable development of the Classical Karst Area Promoting the linguistic minorities, their culture and identities Digitalising the tourism sector to help product diversification and recovery after the pandemic Developing integrated tourism products based on the natural and cultural resources of the area (e.g., implementing cultural itineraries based on rural, urban and coastal linkages)	083 - Cycling infrastructures 165 - Protection, development and promotion of public tourism assets and tourism services 166 - Protection, development and promotion of cultural heritage and cultural services

			Contribute to the implementation of macro-regional connections designing / planning /realizing sections of the ADRIONCYCLETOUR cycle route flagship Strengthening the linkage between education and tourism/cultural labour market by investing in bilingual and inclusive education and training	
ISO 1	ISO 1b - enhance efficient public administration by promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular, with a view to resolving legal and other obstacles in border regions	Increase governance capacity to optimize services for citizens	Supporting strategies for multimodal accessibility in view of a better and sustainable connectivity among urban, rural and coastal areas, increasing the offer of cross-border public transport services (land, sea) in favor of residents, commuters, students and tourists Joint investments to improve quality and accessibility of public services for the benefit of the most isolated and remote areas (i.e., through telemedicine, e-services for and disadvantaged groups etc.) exploiting ICT technologies to share and process data and developing a bilingual offer Exchange of experience and data, training programmes to enhance the capacity of public authorities to design and implement integrated cross-border initiatives on specific issues for the Programme area (e.g., inner and maritime mobility, health services, etc.) Improving institutional multilevel governance to reduce administrative, cultural and social obstacles and promote common solutions in specific sectors (e.g., labour market, health services)	109 - Multimodal transport (not urban) 173 - Enhancing institutional capacity of PAs and stakeholders to implement territorial cooperation projects and initiatives in a cross-border, transnational, maritime and inter-regional context
	ISO 1c - build up mutual trust, in particular by encouraging people-to-people actions	Support small-scale projects through people-to-people cross-border initiatives	Supporting all types of joint actions in order to strengthen the cross-border common roots and identity, to build trust and to overcome existing obstacles (language, culture, geography) Valorising and promoting local cultural elements, such as traditions, customs, art, local food and wine products, from an economic and touristic point of view by participation in international trade fairs and promotional events, organisation of joint workshops, etc. Promoting exchange of experiences, networking, living labs bringing together citizens and local actors to foster cooperation in the field of sport, education, nature, and other fields of common interest Integrated digitalisation of the cross-border cultural heritage to increase its accessibility to the public and implementing promotional digital solutions, e.g., digital platforms, apps Creating education and training possibilities taking into account the needs of national minorities living in the Programme area, such as materials for schools and universities on history, culture, languages and identity of National Minorities, entrepreneurial training courses, targeted language courses, camps for children and young people, etc.	171 - Enhancing cooperation with partners both within and outside the Member State

Table 1.1: the logical chain of the IP, from Priorities to Intervention fields

1.3. Financing Plan

The IP is financed with more than 66 million of Euro, totally made available by the European Regional Development Fund (ERDF).

The Policy Objectives with the higher financial endowment is PO 4 ("A more social and inclusive Europe …") with almost 30 million. It is followed by PO 2 (A greener, low-carbon transitioning towards a net zero carbon economy and resilient Europe …) with almost 25, PO 1 ("A more competitive and smarter Europe …), and ISO 1 ("A better cooperation governance"), the last two with almost 6,5 and slightly more than 5 million respectively.

The complete financing scheme, extracted by the official IP, is reported in the following Table:

Priorities (PO) and Specific Objectives (SO)	Percentage (%)	Euro (€)
PO 1	9,72%	6.439.065,00
PO 2	37,44%	24.808.273,00
SO 4	14,10%	9.342.721,00
SO 6	7,99%	5.294.208,00
SO 7	15,35%	10.171.344,00
PO 4	45,05%	29.853.250,00
ISO 1	7,79%	5.159.845,00
ISO 1b	5,52%	3.659.845,00
ISO 1c	2,26%	1.500.000,00
Total	***100%***	***66.260.433,00***

Table 1.2: the financing plan of the IP

1.4. Complementarity and synergies with other programmes and MRS

The cross-border area is included in both the EUSAIR and EUSALP macro-regional strategies. The 2021-27 Programme will need to coordinate with the existing priorities under EUSALP and EUSAIR macro-regional strategies to create synergies with regular projects and their flagship projects.

Several potential uptake and synergies can be envisaged with the EUSALP strategy, ranging from the focus on remote and rural areas, to water-soil and river management, and from the focus on youth and elderly to the quality of life of the citizens. Other topics with potential for cross-border synergies could be energy transition, sustainable mobility, digital innovation, natural risk governance. The 2014-20 Programme offered good examples of projects implemented on these topics that could be further capitalized, such as CROSSCARE, SECAP, INTERBIKE II and PRIMIS.

On the other side, in line with the examples presented in the second thematic report on projects related to the European Green Deal objectives, many projects could be taken as example. Concerning sustainable mobility, SaMBa and MELINDA Alpine Space projects are representative, because of their focus on the passengers' behavior by examining how people can be motivated to switch to sustainable means of transport. Moreover, two Alpine Space projects already contributed directly also to the topic of circular economy: GREENCYCLE and CYRCULAR 4.0. In the field of clean energy solutions, also two Alpine Space programme/EUSALP projects have been put forward: AlpGrid and BB-clean.

Potential uptake and synergies emerge also with the EUSAIR strategy. First, the focus on the sea and maritime areas as well as on connections between sea and hinterland areas in terms of sustainable mobility, involving sea transport governance, in a Blue Growth perspective. Furthermore, environmental quality and tourism and the protection and restoration of coastal wetland areas, land karst, and grassland fields are also areas of consistency. Within the EUSAIR Flagship Booklets some Italy-Slovenia projects of the 2014-20 Programme were identified as coherent with the strategic projects of EUSAIR pillars, and namely BIOAPP and GREENHULL for Pillar 1, CLEAN BERTH for Pillar 2, TETRAMARA for Pillar 3 (EUSAIR Flagship Booklets) by the Italian Cohesion Agency.

Moreover, there were already examples of Italy-Slovenia projects highlighted as good projects for the Adrion Programme (e.g., projects CrossMoby, InterBike and Lighting Solutions) and cooperation with Adrion could intensify. EUSAIR also recognizes initiatives linked to the Youth Manifesto, Young POPRI – the concept developed by Primorski tehnološki park. Two Alpine Space projects also focusing on youth, GaYA and YOUrALPS could also be taken into consideration.

1.5. Contribution of the SEA to the Programme

The SEA team was engaged early on in the programming process of the Interreg VI-A Italy-Slovenia 2021-2027 Programme and was able to establish a constructive cooperation with all stakeholders in the programming process. This resulted in regular online communication and meetings, especially at key moments of the programming process. SEA team was also invited to follow and contribute to Task Force meetings.

Subsequently, the SEA team was able to closely monitor the programming process. A draft Environmental Report was also prepared in December 2021 (based on IP draft version 2 from 7. 12. 2021) with a clear aim to guide the programming process by providing early warnings about potential negative impacts of the IP on environment, while at the same time also providing enhancement measures and recommendations to further enhance overall positive impact of the IP on environment. Its results were also presented on the 20th Task Force meeting (21st December 2021).

As a result of all above presented activities, we can report that a significant number of proposed mitigation measures, enhancement measures and recommendations were integrated in the final draft version of the IP (final draft version 5, dated with 31st March 2022). In the table below, we present a quick assessment on the level of their integration in the IP.

Proposed mitigation measures, enhancement measures and recommendations	Relevant Specific Objective	Assessment on the level of their integration
The wording of the action 5 in SO 2.6 should be changed to state: *"Developing and testing innovative technologies following the concepts of industrial symbiosis and facilitating waste reuse, as well as carbon capture, utilization or storage."*	SO 2.6	Stated recommendation was integrated in the final draft version of the IP by appropriately changing the wording of the action in question within SO 2.6. With this the SEA team considers proposed recommendation fully integrated.
The following action could be added to SO 2.7 (or any other SO within the PO2 framework, if considered a better fit form the IP programming team) as an IP enhancement measure: *"Promoting sustainable spatial planning, including transfer of best practices and pilot actions linked to application of sustainable spatial planning solutions aiming to preserve soil as a natural resource and ensure sustainable land use and landscape management."*	SO 2.7	Stated recommendation was integrated in the final draft version of the IP by adding a new exemplary action within SO 2.7. With this the SEA team considers proposed recommendation fully integrated.
The third exemplary action for Action A 2.6.1 can be modified as follows: *"Supporting projects relating to ecosystem services (e.g., pro biodiversity business) and water management"*	SO 2.6	Stated recommendation was integrated in the final draft version of the IP by appropriately changing the wording of the action in question within SO 2.6. With this the SEA team considers proposed recommendation fully integrated.
SO 2.4 could enhance its effect on biodiversity from moderate (+1) to significant (+2) if measures for naturalistic engineering are explicitly considered. In this way, the 4th exem-	SO 2.4	Stated recommendation was integrated in the final draft version of the IP by appropriately changing the wording of the action in question within SO 2.4. With this

plary action could be reframed as follows: *"Promoting investments for the development/strengthening/modelling of joint early warning and risk monitoring systems as well as small infrastructures for risk prevention and management, even with bio-engineering techniques".*		the SEA team considers proposed recommendation fully integrated.
Actions for SO 2.6 are explicitly addressing supply chains in the context of innovation and circular economy. They could further address the aspect of circularity in the land use and in the food production as part of the wider sense of circular economy, changing the wording in: *"Supporting the creation of experimental supply chains in the context of the circular economy and sustainable food production, using digital technologies and artificial intelligence."*	SO 2.6	Stated recommendation was integrated in the final draft version of the IP by appropriately changing the wording of the action in question within SO 2.6. With this the SEA team considers proposed recommendation fully integrated.

Table 1.3: Assessment on the level of the integration of proposed mitigation measures, enhancement measures and recommendations from previous versions of the Environmental Report into the final draft version of the IP.

All other mitigation measures, enhancement measures and recommendations are presented in Chapters 6 and 7.

2. Methodological approach

2.1 Aims of the Strategic Environmental Assessment

A SEA for the future Interreg Italy-Slovenia 2021-2027 Programme (hereinafter IP) is conducted in accordance with the *EU Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (hereinafter SEA Directive)* and the *UNECE Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context (hereinafter SEA Protocol)*.

The SEA generally describes the evaluation of the likely environmental, including health, effects, which comprises the determination of the scope of an environmental report and its preparation, the carrying- out of public participation and consultations, and the taking into account of the environmental report and the results of the public participation and consultations in a plan or programme.

The goal of this particular SEA is to further strengthen environmental considerations into the preparation and adoption of the IP. Specifically, the SEA process aims to:

- Support **sustainable development considerations and aspirations** formulated during the elaboration of the programme proposal.
- Systematically consider impacts and contributions of the proposed programme on the r**elevant environmental policy objectives adopted at the EU and national levels**.
- Assess the likely significant impacts (**positive and adverse**) of interventions proposed in the programme and their cumulative effects on key environmental issues in the programme area.
- Suggest **mitigation measures** that help to avoid, minimize or offset potentially adverse impacts and **enhancement measures** that enhance environmental benefits and positive side-effects of the programme
- **Engage environmental authorities** early in the process and **provide opportunities for consultations with the public concerned**.

2.2 The Strategic Environmental Assessment process

The Interreg Italy-Slovenia 2021-2027 Programme Managing Authority has commissioned the SEA alongside with the Programme development support to independent external experts selected through a tendering process – Archidata Srl. The SEA was integrated into the IP elaboration and in terms of the SEA procedure involved the following standard steps.

Steps of the SEA process	Schedule	Status
Kick off meeting	December 2020	Completed
Integrating SEA into the programming process timeline	January-May 2021	Completed
Scoping and consultations with environmental authorities	June-October 2021	Completed
Draft Environmental Report	November 2021-March 2022	Completed
Internal revision of the Draft Environmental Report & coordination with the Programming team	March 2022	Completed
Final Draft Environmental Report	March 2022	Completed
Approval of the Final Draft Environmental Report by Responsible Environmental Authorities	April 2022	Ongoing
Consultations of responsible Environmental Authorities and the public on Environmental Report	May 2022	-
Documentation of consultations and final Environmental Report	June 2022	-
Environmental statement	After IP adoption	-
Expected end of the process	June-July 2022	-

Table 2.1: SEA procedure, timeline and status

The assignment was performed in an interactive way between the contractor and the MA/JS through regular virtual meetings and exchanges on the progress of the SEA. In practical terms, the SEA process has involved the following technical tasks that provided inputs into the formulation of the Interreg Italy-Slovenia 2021-2027 Programme (hereafter IP):

- The SEA team has started by elaborating an environmental reference framework for the IP using a very early draft IP (during May-June 2020). The framework was closely discussed with the IP programming team and was included in the SEA scoping report that was sent to the relevant environmental authorities in Italy and Slovenia.
- The scoping consultations in Italy and Slovenia provided inputs into the finalisation of the environmental reference framework. Annex 1 provides an overview of the comments obtained in the scoping process and responses given by the SEA team and the programming team.
- Additionally, several working sessions were organized to discuss initially the working draft of IP. Feedback from the SEA team provided through these exchanges presents key suggestions provided by the SEA team. All relevant comments were fully integrated into the IP working draft.

The resulting IP proposal which was used for the elaboration of this SEA Report has been, thanks to these multiple interactions, fully optimized with regard to the SEA process inputs. The SEA report presented here assesses the impacts of the IP proposal on the expected future evolution of the environmental baseline trends (zero-alternative) and highlights only few outstanding issues of concern that should be considered before and during the formal IP adoption and implementation.

2.3 Assessment tools and methods

The relevant frame for assessments is set up by the environmental aspects outlined in the SEA Directive and the subsequently identified relevant environmental objectives which are potentially impacted by the programme.

2.3.1 The current state of the environment and zero alternative

The SEA Directive (Annex I, b) requires a description of the current state of the environment, including its likely development in the event of non-implementation of the IP – the so called “Zero Alternative” (hereinafter ZA).

The SEA team relied on publicly available data, monitoring reports and own GIS and statistical analysis to describe the current state of the environment per individual environmental segments. Analysis was focused on pre-identified key indicators, later on also used to in the potential impact assessment process.

To define the zero alternative, a qualitative trend estimation was executed, based on available data and trends from literature.

Symbol	Description
↑	Improving trend – understood as a general improvement of the current state of the environment
↗	Partially or gradually improving trend – understood as partial or gradual improvement of the current state of the environment
←→	Unchanged trend – understood as no significant change in the current state of the environment
↘	Partially or gradually deteriorating trend – understood as partial or gradual deterioration of the current state of the environment
↓	Deteriorating trend – understood as a general deterioration of the current state of environment

Table 2.2: SEA procedure, qualitative trend assessment for the Zero Alternative (ZA)

2.3.2 Assessment of alternatives

The future Interreg Italy-Slovenia 2021-2027 Programme is a result of a programme development process, in which several other strategic priorities, specific objectives, measures or applicable activities have been considered. Other interested parties also participated in this process – providing own ideas and directions. However, its current form and content (Final Draft version 5, March 31st, 2022) is one on which both parties have agreed upon – thus, deciding that this programme is best suited for the needs of the area, as well as effective within its available budget. Therefore, there are no programme level alternatives of the Interreg Italy-Slovenia 2021-2027 Programme that should be considered within this SEA Report.

Nonetheless, it is one of key tasks of any SEA to deliver mitigation or enhancement measures, which could take form of additionally proposed activities to be supported by the IP or modification of already proposed activities by the IP. The need for such intervention will be investigated and argumented on the level of individual specific objectives during the assessment of potential impacts of the IP.

The event of not implementing the programme, which can be considered as "zero alternative" is quite unlikely. In this situation the baseline conditions of the programme area would remain the same, i.e. the positive and adverse programme implementation impacts would not occur and currently identified trends would most likely continue.

2.3.3 Assessment of environmental impacts

Potential impacts identified in the scoping phase were more precisely defined in the SEA Report according to the following table.

Type and significance	Description
Direct impact	Is detected if the programme plans actions/interventions that could have direct impacts on the selected indicators.
Remote impact	Is detected if the programme plans actions/interventions that could have impacts detectable further away from the planned locations.
Cumulative impact	Is detected if the programme plans actions/interventions that could have negligible impacts on the selected indicators, however could have a significant impact on the selected indicators when assessed cumulatively with existing interventions, planned interventions and those that are envisioned by other plans, or when several negligible impacts of one action/intervention add up to a significant impact on the selected indicators.
Synergic impact	Is detected if the programme plans actions/interventions that could have impacts greater that a mere sum of individual impacts.
Impact persistence	Temporary impact: impact of a passing nature. Short-term impact: impact that ceases to affect the selected indicators within five (5) years. Mid-term impact: impact that ceases to affect the selected indicators in the period of five (5) to ten (10) years. Long-term impact: impact that ceases to affect the selected indicators after ten (10) years. Permanent impact: impact that has permanent consequences.

Table 2.3: SEA procedure, type and significance of potential impacts of the IP on the environment

Impacts were assessed on the basis of changes in impact indicators in regard to of the state of the environment and the importance of these changes, the level at which environmental protection objectives were taken into account during the IP preparation and other evaluation criteria.

The actual assessment used the guiding questions determined at the end of the scoping process and involved matrices with the textual explanations of the potentially significant impacts of the interventions proposed in the programming document using template presented below. The analysis was conducted on an issue-by-issue basis, which facilitated consideration of potential cumulative or synergistic impacts of the entire Interreg VI-A Italy-Slovenia 2021-2027 Programme proposal on each environmental issue/concern.

IP proposals	Benefits & risks			Explanations
	+*	**-****	**TB*****	
…	…	…	…	…

* Potential positive impacts – benefits / ** Potential adverse impacts – risks / *** Potential transboundary impacts

Table 2.4: SEA procedure, scheme for the assessment of IP SOs and Actions

The assessment was based on the following impact assessment key:

+2	+1	0	-1	-2	T+	T-
Significant positive impact	Non-significant positive impact	Very limited impact or no impact	Non-significant adverse impact	Significant adverse impact	Transboundary positive impact	Transboundary negative impact

Table 2.5: SEA procedure, Impact assessment scores and evaluations

The assessment has also taken into consideration the fact that the IP primarily focuses on transnational coordination, strategic and operational planning, innovation, capacity building and skills improvement, best practice transfer and knowledge exchange. It involves "limited investment" interventions - any supported actions with an "investment character" will be supported for the purpose of the piloting of innovative solutions. This often meant that only localized direct impacts can be reasonably expected in case of specific projects and their pilot actions.

Within this context, the assessment worked with plausible scenarios of best-case and worst-case implications that can realistically result from implementation of the proposed interventions in different settings. The assessment was firstly executed on the level of an individual specific objective (SO), while cumulative, synergic and transboundary nature of impacts was assessed in the second phase on the level of the whole IP.

The key added value of this approach was the resulting recommendations on environmental mitigation and enhancement measures adjusted on the basis of the European Green Deal aspirations – the following table shows the new mitigation hierarchy reflecting the European Green Deal ambitions developed by the EuropeAid Environment and Climate Change Mainstreaming Facility.

Type		Meaning
Mitigate **to ensure no net loss of environmental quality and ecosystem services**	Avoid	Avoid the impact altogether
	Minimize	Minimize the impact or rectify the impact by repairing, rehabilitating, or restoring the affected environment
	Offset	Compensate for the impact by replacing or providing substitute for lost ecosystems and ecosystem services
Enhance **with an aspiration to achieve net gain in environmental quality and ecosystem services**	Regenerate	Improve the environmental quality and enhance/restore biodiversity and the ecosystem functions and services

Table 2.6: SEA procedure, Green Deal adjusted mitigation and enhancement hierarchy. Source: Palerm & Slotweeg (2020) and IAIA (2018)

2.4 Relevant subsequent levels for environmental assessments

The assessment of the IP Italy-Slovenia revealed no potential significant negative impacts of the programme on the environment. However, at the current stage, no concrete projects but only the operational framework in the form of the IP is known. Thus, we have to point out that concrete projects can potentially have environmental impacts which cannot be foreseen in their entirety or concreteness at the current stage. E.g., depending on the concrete site and the location in relation to protected areas, a construction project can have different impacts on protection of areas or habitats. These might require additional assessments on project level at a later stage.

However, all such projects must comply with national environmental and spatial planning legislation, as well as obtain all mandatory permits prior to applying for co-financing from the IP. This means that they have to be planned through appropriate spatial planning/project documents for which separate SEAs/EIAs have to be prepared and their environmental impact checked on a lower planning level.

2.4.1 Implementation of the Do No Significant Harm principle in the IP

This SEA for IP Italy-Slovenia is run under the rule and the guidelines of the Italian procedure for

SEA.

With the guidance note sent to the MAs of IPs on 7th December 2021, the Italian Department for the Cohesion Policies remarked the obligation to consider the horizontal Do No Significant Harm principle (hereafter DNSH) in all the programmes co-funded by Cohesion Policy 2021-2027.

The DNSH principle is aimed to ensure that Cohesion funds support activities and investment in line with climate and environmental standards and objectives of the European Union as reported by Article 17 of EU Regulation 852/2020. In particular, it asks to assess the degree of harmfulness of actions and investments on six environmental objectives: 1. the mitigation of climate change; 2. the adaption to climate change; 3. the quality of fresh and marine water; 4. the circular economy, with emphasis on waste prevention and recycling; 5. the pollution of air, soils and water; 6. the protection of biodiversity.

Contextually, the Italian Ministry for Ecological Transition, i.e. the National Environmental. Authority for SEA, provided a technical and methodological indications according to which SEA represents the tool ensuring the higher completeness of assessment analyses, where all topics of the six-objectives from DNSH are considered.

As a consequence, the SEA Environmental Report takes care of the DNSH, ensuring that whatever relates with the six mentioned environmental objectives for DNSH is evident and easily detectable in the environmental report itself and in the following non-technical summary. To deal with the issue, we will dedicate a specific space to DNSH in Section 6. ("Assessment of potential environmental impacts with proposed mitigation or enhancement measures") at the end of each interested environmental fields accordingly to the following table:

DNSH Environmental objectives	SEA Environmental aspects
1. Climate – Mitigation	2. Climate
2. Climate Adaption	
3. Water	3. Water
4. Circular economy	7. Population and human health (waste, circular economy)
5. Pollution	3. Water (pollution)
	4. Soil and land use (pollution)
	7. Population and human health (air pollution)
6. Biodiversity	5. Biodiversity and natural heritage

Table 2.7: subjects' correspondence between SEA assessment and DNSH

Once considered in the assessment procedure, the final outcomes of DNSH, the related possible mitigation measures and implementation measures, and the parts of the environmental report (or of the annexes) that support the conclusions are collected in the specific Section 9. of this report.

3. Conclusions of the Scoping process

The following potential impacts of the Interreg VI-A Italy-Slovenia 2021-2027 Programme (Draft version 1, dated 30th September 2021) to be considered in the SEA were identified in the scoping process:

Programme/Specific Objectives	Specific actions	Potential impacts to be considered in the SEA (P = positive impacts / N = negative impacts)
PO 1 – a more competitive and smarter Europe by promoting in-innovative and smart economic transformation and regional ICT connectivity		
SO 4 - Developing skills for smart specialisation, industrial transition and entrepreneurship	A 1.4.1 – Promoting a cross-border ecosystem for research and innovation in common specialisations areas	P Improved knowledge and skills on circular economy processes P Overall reduction of environmental footprint P New research on circular economy, environmental protection and climate change P Reduction in pesticide use P Reduction in the use of raw materials P Reduction in GHG emission P Reducing air pollution P Improvement in environmental and energy performance in SMEs N /
PO 2 – a greener, low-carbon transitioning towards a net zero carbon economy and resilient Europe by promoting clean and fair energy transition, green and blue investment, the circular economy, climate change mitigation and adaptation and risk prevention and management		
SO4 - Promoting climate change adaptation and disaster risk prevention, resilience, taking into account ecosystem-based approaches	A 2.4.1 - Foster resilience capacity to climate change and mitigate risks related to natural disasters	P Improved condition (state) and management of natural heritage Natura 2000 areas and protected areas P Improved monitoring of Natura 2000 sites P Reduction in GHG emissions P Reduction in air pollutants P Reduction in water pollutants P Improved knowledge and skills on circular economy processes P Use of green technologies for the sustainable enhancement (vineyards, gardens, parks) P Improvement and conservation of the coastal and marine habitat P Efficient management of hydraulic risk P Improvement in environmental and energy performance in SMEs N Potential negative impact of new infrastructures (energy sites, e-mobility infrastructures)
SO6 - promoting the transition to a circular and resource efficient economy	A 2.6.1 – Develop shared model/solutions for the circular economy	
SO7 - Enhancing protection and preservation of nature, biodiversity, and green infrastructure, including in urban areas, and reducing all forms of pollution	A 2.7.1 - Conservation, protection, promotion of the cross-border area natural capital	
SO 8 - Promoting sustainable multimodal urban mobility, as part of transition to a net zero carbon economy	A 2.8.1 - Joint investments for the development of innovative, inclusive and sustainable mobility	
PO 4 – a more social and inclusive Europe implementing the European Pillar of Social Rights		
SO 6 - enhancing the role of culture and sustainable tourism in economic development, social inclusion and social innovation	A 4.6.1 – Implementing sustainable and innovative practices in tourism to boost local economy	P Development of green tourism as an alternative P Realization of sustainable tourism visits P Improved quality of tourism supply (with prolonged time of stay)
	A 4.6.2 - Preservation, maintenance	P Improved condition (state) and management of natural heritage and

	and promotion of the cultural heritage		protected areas.
	A 4.6.3 – Promoting education and training in cultural and tourism sector to foster employability and social inclusion	N	Potentially increased pressures to environment due to increased tourism flows (disruption of flora and fauna in protected areas and Natura 2000 sites)
		N	Potentially increased pressures to environment due to increased tourism flows (higher soil and water pollution, higher water consumption)
		N	Potentially adverse impacts on tangible and intangible attributes of cultural and natural heritage
INTERREG Specific Objectives			
ISO 1.ii - enhance efficient public administration by promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular, with a view to resolving legal and other obstacles in border regions	A ISO1.ii.1 Increase governance capacity to optimize services for citizens	P	Improved management, environ-mental accessibility and risk management
	A ISO1.ii.2 Inter-programme coordination	P	Efficient management of hydraulic risk
		P	Improved monitoring and management of target water basins and rivers
		P	Circulation on information on common environmental issues
		P	Increased networking and cooperation in the field of nature conservation
ISO 1.iii - build up mutual trust, in particular by encouraging people-to-people actions	A ISO1.iii.1 Support small-scale and people-to-people cross-border initiatives	P	Development of green Technologies for a cross- border water and dangerous waste management
		N	/

Table 3.1: Potential impacts identification table from Scoping

At that point it was clear from Table 3.1 results that predominantly positive impacts of IP on environment were recognized during scoping. Only three real points of concern or potentially negative impact were recognized:

- Increased pressures to environment due to increased tourism.
- Potential negative impact of new small-scale infrastructures.
- Potentially adverse impacts on tangible and intangible attributes of cultural and natural heritage.

On the other hand, IP offered further opportunity for enhancements of positive impacts on environment. For example – at the time, the Programme predominantly focused on adaptation to climate changes, however almost no effort (except from sustainable mobility) was put to mitigation of climate change. Subsequently, the SEA team recommend to the programming team to address above recognized key issues in the following programming steps, especially on the level of description of proposed/potentially supported activities.

The draft of the Scoping Report was sent out to responsible Environmental Authorities in the programme area in June 2021. In both countries a written scoping procedure was carried out, collecting written responses and comments. In Slovenia, this process was finalized with an online scoping workshop, organized on September 7th, 2021. Based on received responses and comments the final version of Scoping Report was prepared in October 2021. The SEA team used the inputs form the scoping procedure to define environmental objectives of the Environmental Report and indicators used to assess impacts of the IP on the environment.

4. Environmental aspects, issues, objectives and indicators

Based on conclusions from scoping, all environmental aspects and all identified environmental issues and concerns are the subject of the SEA assessment. The analysis of environmental policy frameworks on international and national levels resulted in definition of the following environmental objectives and indicators – to be used for the purpose of the assessment.

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL ISSUES AND CONCERNS	ENVIRONMENTAL OBJECTIVES	SOURCES OF OBJECTIVES	ENVIRONMENTAL INDICATORS	SOURCES OF INDICATORS
Air	Air pollution	Reduction of emission levels in consideration of respective emission limits	• Ambient Air Quality Directive (EU, 2008); Clean Air Programme for Europe (EC, 2013); EU 2030 Climate and Energy Framework; EU Directive 2001/81/EC (Directive on national emission ceilings for certain atmospheric pollutants) • D.Lgs 81/2018 (reduction of national emissions of certain atmospheric pollutants. Implementation of directive 2016/2284 /EU) • Slovenian Decree on Ambient Air Quality; Slovenian Operational Programme of Air Pollution Control; Slovenian Operational Programme for the Protection of Ambient Air against Pollution Caused by PM10	Average emission levels of the main air pollutants (NOx, PM10, PM2,5, O3, SO2)	• National System for Environmental Protection - National report on air quality • FVG's Regional Agency for Environmental Protection and Veneto's Regional Agency for Environmental Protection - Annual Air Quality Report • Slovenian Environment Agency – Annual Air Quality Report
Climate	Climate change mitigation (GHG emission reductions, renewable energy, energy efficiency)	Reduction of GHG emissions by: - 33% in 2030 compared to 2005 for Italy - 36% in 2030 compared to 2005 for Slovenia	• Paris agreement; EU 2030 Climate- and Energy Framework; EU Renewable Energy Directive II; EU-Directive Energy 2012/27/EU (Energy Efficiency Directive) • Italy's Integrated National Energy and Climate Plan (2019) • Integrated National Energy and Climate Plan of the Republic of Slovenia (NEPN)	Greenhouse gas emissions	• Italian Higher Institute for Environmental Protection and Research - Italian greenhouse gas inventory 1990-2019 • FVG regional air emissions inventory; Veneto regional air emissions inventory (INEMAR) • Italian National Institute of Statistics database • Italian Energy Services Manager - Monitoring report of renewable sources in Italy and in the Regions • Integrated National Energy and Climate Plan of the Republic of Slovenia • Slovenian Environment Agency – Environmental Indicators Platform; Report on the State of Energy (SI) • National Inventory Report Slovenia • Statistical Office of the Republic of Slovenia (SiStat)
		Fostering of renewable energy sources		Share of renewable energy in gross final energy consumption	
		Improvement of energy efficiency		Final energy consumption	
	Climate change adaptation (adaptive capacity and adaptation measures)	Strengthen resilience and the capacity to adapt to climate-related hazards and natural disasters in all countries	• Paris agreement • National strategy (2015) and Plan (2018) for adaptation to climate change; National strategy for biodiversity (2010) • National Water Management Program (NPUV) within Resolution on the National Environmental Protection Program for the period 2020-2030 (ReNPVO20-30)		
Water	Protection and restoration of water ecosystems and wetlands	Protection of surface water against pollution, harmful substances and Hydro-morphological pressures	• EU-Directive 2000/60/EC (Water Framework Directive); UNECE Convention on the Protection and Use of Transboundary Watercourses; Alpine Convention; Agenda 2030; The Seventh Environment Action Programme (7th EAP); Marine Strategy Framework Directive (2008/56/EC)	Ecological and chemical status of surface water bodies	• Italian Higher Institute for Environmental Protection and Research - Annual Environmental data report • FVG's Regional Agency for Environmental Protection and Veneto's Regional Agency
	Hydro-morphological pressures				

	Pollution pressures on surface water and links to human health		• Italian National strategy for sustainable development; Italian strategy for the sea for the period 2018-2024; Veneto's Director Plan 2000; Veneto's Water protection plan; FVG's Water protection plan; Water management plan of the Eastern Alps 2015-2021 • Integrated National Energy and Climate Plan of the Republic of Slovenia (NEPN)		for Environmental Protection - Water Quality Report • Slovenian Environment Agency – Assessment of the chemical status of groundwater in Slovenia; Quantitative status of groundwater in Slovenia; Chemical status of surface waters in Slovenia; Ecological status of surface waters in Slovenia; Water exploitation index in Slovenia • Statistical Office of the Republic of Slovenia (SiStat)
	Pollution pressures on groundwater and links to human health	Protection of groundwater against pollution and harmful substances		Chemical and quantitative status of groundwater bodies	
	Water abstraction and its pressures on surface water bodies and groundwater	Sustainable use of surface water and groundwater		Water exploitation index	
Soil and land use	Ensuring sustainable use of land and soil	Ensuring sustainable use of land and soil	• The Seventh Environment Action Programme (7th EAP); Alpine Convention; Roadmap to a resource efficient Europe (EU); EU Soil Thematic Strategy • National strategy for sustainable development (2017); L.R. 14/2017 (Provisions for the containment of soil consumption); National plan for hydrogeological risk mitigation (2019) • Resolution on the National Environmental Protection Program for the period 2020-2030 (ReNPVO20-30); Spatial Development Strategy of Slovenia	Land take Land use/cover change by categories Area of functionally degraded areas	• European Environment Agency, Land take and net land take (available on a national level) • European Environment Agency, Imperviousness and imperviousness change in Europe (available on a national level) • OECD, Corine Land Cover Change • National System for Environmental Protection - Land take Italian report
	Preventing loss of soil and soil pollution	Preventing loss of soil and soil pollution		Quality of soil and soil pollution	• EUSIS – European soil information system • European Environment Agency, Progress in management of contaminated sites • Italian Higher Institute for Environmental Protection and Research - The state of contaminated sites in Italy: regional data • Italian Ministry of the Environment - Report on the state of the environment • FVG's Regional Agency for Environmental Protection and Veneto's Regional Agency for Environmental Protection - Soil quality report • Slovenian Environment Agency, functionally degraded areas
Biodiversity and Natura 2000	Protection and preservation of biodiversity and natural ecosystems	Safeguarding the biodiversity of the flora and fauna, as well as their habitats, and maintaining the quality of protected areas including natural values	• Agenda 2030; EU-Directive 92/43/EEC (Habitats Directive); EU-Directive 2009/147/EC (Birds Directive); EU Biodiversity Strategy 2030; Action plan for nature, people and the economy • Italy's National strategy for sustainable development (2017) • Resolution on the National Environmental Protection Program for the period 2020-2030 (ReNPVO20-30)	Development of nature protection areas (by categories) Favourable condition of species of European interest Favourable condition of habitats of European interest Number of natural values in favourable condition	• Italian Higher Institute for Environmental Protection and Research and Italian Journal of Ornithology - Summary of the conservation status of species and habitats of community interest • The Institute of the Republic of Slovenia for Nature Conservation • Slovenian Environment Agency
	Protection and preservation of Natura 2000 species and habitats				
	Promotion of green infrastruc-	Promoting green infrastructure and eco-	• Green infrastructure – Enhancing Europe's natural capital (GI strategy); Action plan for nature, people and the economy	Green areas per-capita	• Italian Higher Institute for Environmental Protection and Research and Italian Institute for Statistics (ISTAT)

	ture and ecosystem-based management	system-based management	• Italy's National strategy for sustainable development (2017) • Resolution on the National Environmental Protection Program for the period 2020-2030 (ReNPVO20-30)		• The Institute of the Republic of Slovenia for Nature Conservation and Slovenian Institute for Statistics
Population and human health	Impacts of noise pollution on human health and well-being	Reduce the population share exposed to excessive noise levels	• EU-Directive 2002/49/EC (Environmental Noise Directive); WHO, 2018, Environmental Noise Guidelines for the European Region • National law 447/1995 (IT) • Regulation on limit values for environmental noise indicators for the Republic of Slovenia; Operational Programme for Noise Protection, 2018, Government of the Republic of Slovenia	Number of people exposed to excessive noise levels	• European Environment Agency - Environment noise Report • Italian National Institute of Statistics database • FVG's Regional Agency for Environmental Protection and Veneto's Regional Agency for Environmental Protection - Database • Government of the Republic of Slovenia – Operational Programme for Noise Protection
	Solid and hazardous Waste	Reduction and efficient recycling of waste	• EU Directive 2008/98/EC (Waste Framework Directive) • 4th section of D.Lgs. n. 152/2006; National waste prevention program; National waste management program • Waste Management Programme and Waste Prevention Pro-gramme of the Republic of Slovenia, Slovenian Decree on Waste	Generated and deposited waste volume per capita Generated and deposited municipal waste volume per capita	• Italian Higher Institute for Environmental Protection and Research - National waste cadastre • Statistical Office of the Republic of Slovenia (SiStat)
	Solid and hazardous Waste Public health and environmental health	Promotion of recycling and the circular economy Improve public health, well-being and overall quality of life	• EU Directive 2008/98/EC (Waste Framework Directive) • 4th section of D.Lgs. n. 152/2006; National waste prevention program; National waste management program • Waste Management Programme and Waste Prevention Pro-gramme of the Republic of Slovenia, Slovenian Decree on Waste • EU Health for Growth Programme (2014-2020) (COM (2011) 709)	Resource consumption per capita Generated and deposited waste volume per capita Generated and deposited municipal waste volume per capita Life expectancy 'Equivalent personnel' for every thousand 'equivalent patients	• Italian Higher Institute for Environmental Protection and Research - National waste cadastre • Statistical Office of the Republic of Slovenia (SiStat) • Health for All software database • Italian National Health System - special report on healthcare human resources
	Impacts of climate change (floods) on human health and well-being	Reduce the population share exposed to flood risk	• Italian National prevention plan for the period 2020-2025; National strategy for sustainable development (2017); National strategy (2015) and Plan (2018) for adaptation to climate change • Management Program (NPUV) within Resolution on the National Environmental Protection Pro-gram for the period 2020-2030 (ReNPVO20-30) that is based on River basin management plans for the Danube Basin and the Adriatic Sea Basin 2016–2021 and Flood Risk Management Plan 2017–2021	Number of people affected by flood risk	• Ministry of Defence, Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (ACPDR) –Assessment of Flood Risk in the Republic of Slovenia and Preliminary Assessment of Flood Risk in the Republic of Slovenia
	Impacts of noise pollution on human health and well-being	Reduce the population share exposed to excessive noise levels	• EU-Directive 2002/49/EC (Environmental Noise Directive); WHO, 2018, Environmental Noise Guidelines for the European Region • National law 447/1995 (IT) • Regulation on limit values for environmental noise indicators for the Republic of Slovenia; Operational Programme for Noise Protection, 2018, Government of the Republic of	Number of people exposed to excessive noise levels	• European Environment Agency - Environment noise Report • Italian National Institute of Statistics database • FVG's Regional Agency for Environmental Protection and Veneto's Regional Agency for Environmental Protection - Database

			Slovenia		• Government of the Republic of Slovenia – Operational Programme for Noise Protection
Cultural heritage	Protection and preservation of cultural heritage Promotion of participatory management of cultural heritage	Favourable conditions for cultural heritage (both ob-jects and areas) through protection, preservation, and awareness-raising	• UNESCO World Heritage Convention; European Cultural Heritage Strategy for the 21st Century; European Framework for Action on Cultural Heritage • National Plan for Cultural Heritage Education (2017, 1st version); National strategy for sustainable development (2017) • Cultural Heritage Strategy for the period 2018-2026 (MK, 2019); Cultural Heritage Strategy for the period 2020-2023 (MK, 2021)	Number of registered units of cultural heritage Number of units of intangible cultural heritage	• UNESCO, World heritage list; UNESCO, Intangible cultural heritage list • FVG's Informative Service on Cultural Heritage • Italian National Institute of Statistics database • Coordinator for the Safeguarding of the Intangible Cultural Heritage, Register of the Intangible Cultural Heritage (SI)
Landscape	Protection and preservation of landscapes Protection and valorisation of geodiversity and geological heritage	Favourable conditions for landscape management	• European Landscape Convention; Recommendation Rec(2004)3 on conservation of the geological heritage and areas of special geological interest • National strategy for sustainable development (2017); Regional law 15/2016 (Friuli Venezia Giulia) • Spatial Development Strategy of Slovenia; Slovenian Environmental Protection Act; Slovenian Cultural Heritage Protection Act; Slovenian Cultural Heritage Strategy 2020-2023; Slovenian Spatial Planning Act	Extent of protected landscape Risk of agricultural land abandonment Landscape fragmentation	• LUISA Territorial Modelling Platform; European Environment Agency, Landscape frag-mentation pressure and trends in Europe • UNESCO, World heritage list; UNESCO, MAB list; UNESCO Geoparks list • Veneto's Geoportal and FVG's Geoportal • Italian Higher Institute for Environmental Protection and Research - gesoites dcatalogue; Department for the Geological Service of Italy - National inventory of geosites • Slovenian Environment Agency, Protected areas (WFS)

Table 4.1: Connecting environmental aspects, issues and concerns, to environmental objectives and indicators

5. The current state of the environment and the zero alternative

5.1 Air

Air pollution is the single largest environmental health risk in Europe. Air pollutants emitted by a large range of economic activities (and from some natural sources) can affect air quality far away from the source, and therefore represent transboundary issue. However, local effects largely depend on local conditions. Emissions of all primary and precursor pollutants contributing to ambient air concentrations of the main air pollutants decreased between the years 2000 and 2017 in the EU. For example, sulphur dioxide (SO_2) emissions have decreased by 62 % since the year 2000, while ammonia (NH_3) emissions have decreased only slightly by 4 % but have increased in the agriculture sector since 2013 by about 3 %. Reductions in nitrogen oxides (NO_x) emissions have been achieved primarily as a result of fitting three-way catalytic converters to petrol-fuelled cars, driven by the legislative European emission standards. There is also significant downward trend in annual mean concentrations of PM_{10}, $PM_{2,5}$, O_3 and NO_2 at majority of monitoring stations in EU. However, there remain persistent exceedances of the regulated standards especially for PM, NO_2, O_3 and benzo[a]pyrene (BaP) at some stations. High pollutant concentrations are especially serious in urban areas, where it can be mainly attributed to the high levels of emissions from road traffic (as the case of NO_2 shows) and residential combustion in urban areas (namely for $PM_{2.5}$ and BaP). (EEA, 2019)

After 2019, new commitments to reduce emissions for 2020 onwards, and later for 2030 onwards, are applicable under the NEC Directive[2], which sets national emission reduction commitments for Member States and the EU for five main air pollutants (NO_x, non-methane volatile organic compounds (NMVOCs), SO_2, NH_3 and fine particulate matter ($PM_{2.5}$)), but also other pollutants such as carbon monoxide (CO), PM_{10}, toxic metals (cadmium, lead, mercury...) and persistent organic pollutants (POPs). For the EU as a whole, the projections reported by the Member States in 2019 for the year 2030 show that additional efforts are needed to achieve the 2030 emission reduction commitments for all pollutants. This means for NO_x a reduction of almost 40 % compared with 2017 emissions, for NMVOCs and NH_3 around 15 %, and for SO_2 as well as $PM_{2.5}$ more than 30 %. (EEA, 2019)

5.1.1 Air quality

Current situation in Italy

The exceedances of the air pollutant national limit values were registered especially for PM_{10} (daily limit value), NO_2 (annual limit value) and O^3 (daily maximum of the 8-hour moving average). Other pollutants were found problematic only locally (SNPA, 2020).

In the Programme area, among the most common pollutants only PM_{10} and O_3 show exceedances within the limits of the law, to which is added a local excess in the limits of benzopyrene.

PM_{10}**:** The emissions of this pollutant are mainly due to domestic combustion and vehicular traffic. In Italy, PM_{10} emissions were characterized in the period 1990-2018 by a negative trend (- 40%); the reduction since 2005, however, was only 22%. Both Veneto and Friuli-Venezia-Giulia regions have shown stability in the concentration of this pollutant in the period 2015-2019.

In the year 2019[3], even though only 1 measuring point out of 535 recorded an annual average above the national legal limit (40 µg/m³), 111 measuring points (22%) exceeded for more than 35 days per year (the legal threshold) the national daily limit value (50 µg/m³). A large part of this points was located in the basin of Po and at altitudes below 200 m; so, the problem afflicts also the Programme area (entire province of Venice and part of the ex-provinces of Udine and Pordenone). The figure below represents the status as of 2019 in the Programme area.

[2] National Emission reduction Commitments Directive (2016/2284/EU)

[3] The calculation takes the most up-to-date data, not considering the extraordinary period marked by the COVID-19 restrictions.

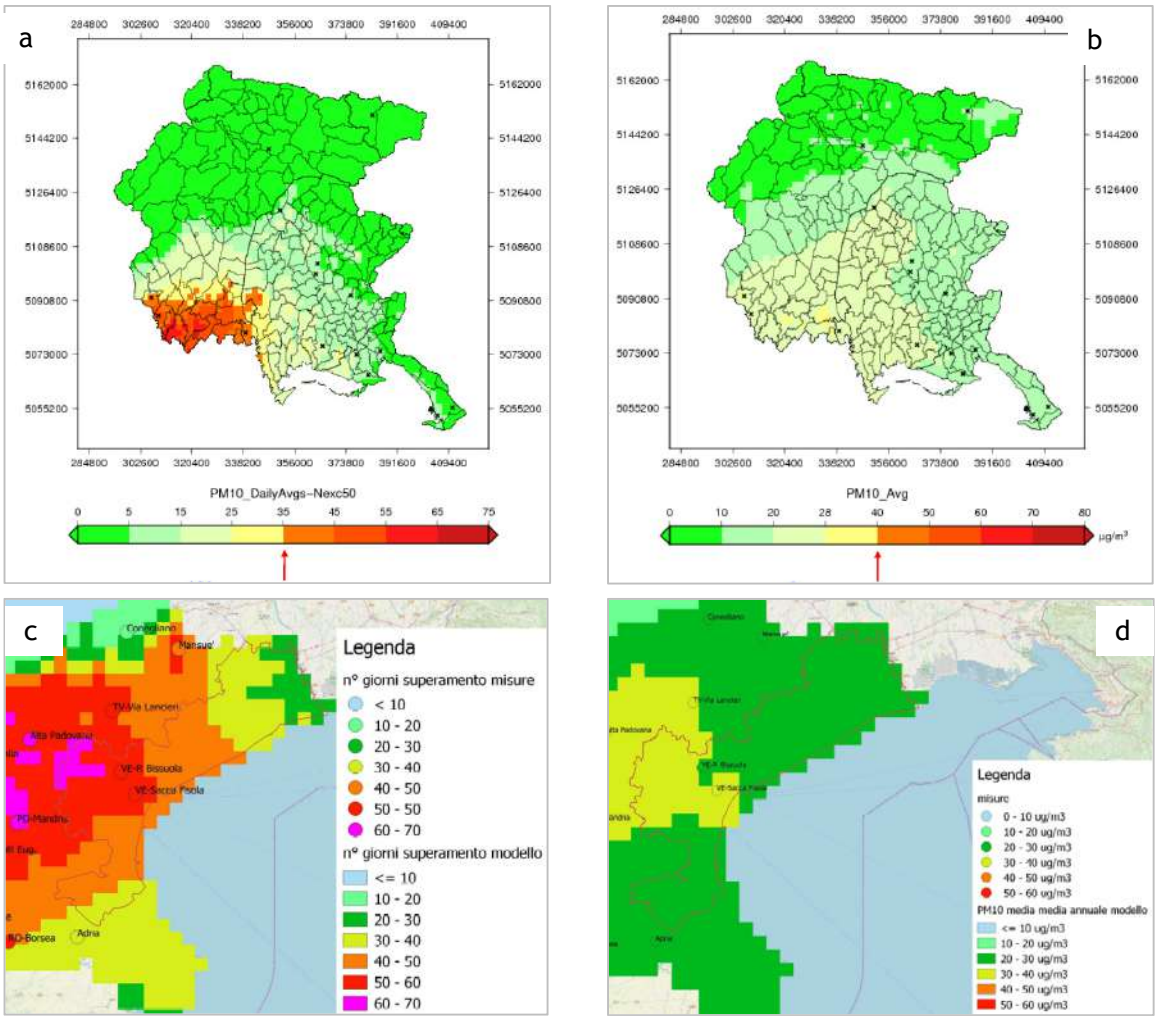


Figure 5.1: number of days of exceedance per year (a, c) and average annual concentration (b, d) of PM_{10} in FVG region and in province of Venice. Source: ARPA FVG and ARPAV Veneto

$PM_{2,5}$: In Italy, $PM_{2,5}$ emissions were characterized in the period 1990-2018 by a negative trend (-38%); the reduction since 2005, however, was only 19%. In Veneto and Friuli Venezia Giulia regions the concentration of this pollutant has signed a slight decrease or stability, in last years. In 2019 the annual limit value of 25 µg/m³ was respected in almost all the monitoring points (283 out of 286). None of the three exception was located inside of the Programme area.

NO_2: The emissions of these pollutants are mainly due to vehicular traffic, industrial combustion and production of electricity. In Italy, NO_x emissions were characterized in the period 1990-2018 by a negative trend (-68%, -48% in 2005-2018). In Veneto and Friuli-Venezia-Giulia regions, generally, the concentration of this pollutant has signed a slight decrease in the period 2015-2019.

In 2019, 30 measuring points out of 576 exceeded annual legal limit (40 µg/m³); they were located mainly in urban or suburban areas of cities' agglomeration, but none of them within the Programme area. With regard to hourly average limit (200 µg/m³, as an hourly average, not to be exceeded more than 18 times per year), all the Italian measuring points respected it in 2019.

Ozone (O_3) is a pollutant formed in the atmosphere as a result of complex chemical reactions occurring in presence of strong insolation, involving nitrogen oxides (NOx), volatile organic compounds (VOCs) and carbon monoxide. In Italy, as well as in the Programme area, O_3 concentrations were stationary in the period 2010-2018, with small fluctuations attributed to seasonality.

In 2019 almost all (92%) of the 322 measuring points have registered at least an overshoot of the

limit (120 µg/m³ like maximum of the 8-hour moving average), and a large part of them was in Northern Italy. Within the Programme area all the measuring points exceeded the limit, in most cases for more than 25 days in a year, namely the three-year average threshold (Figure 5.3).

Other pollutants: especially in northern part of Italy some urban areas are afflicted by exceedance of benzopyrene, because of greater use of woody biomass for heating; a measuring point of the Province of Venice in 2019 has exceeded the legal limit of 1 ng/m³. The other measuring points of the Programme area still record values close to the limit (although lower). Nickel, cadmium, lead, benzene, CO and SO_x have not exceeded the legal limits in any measuring points.

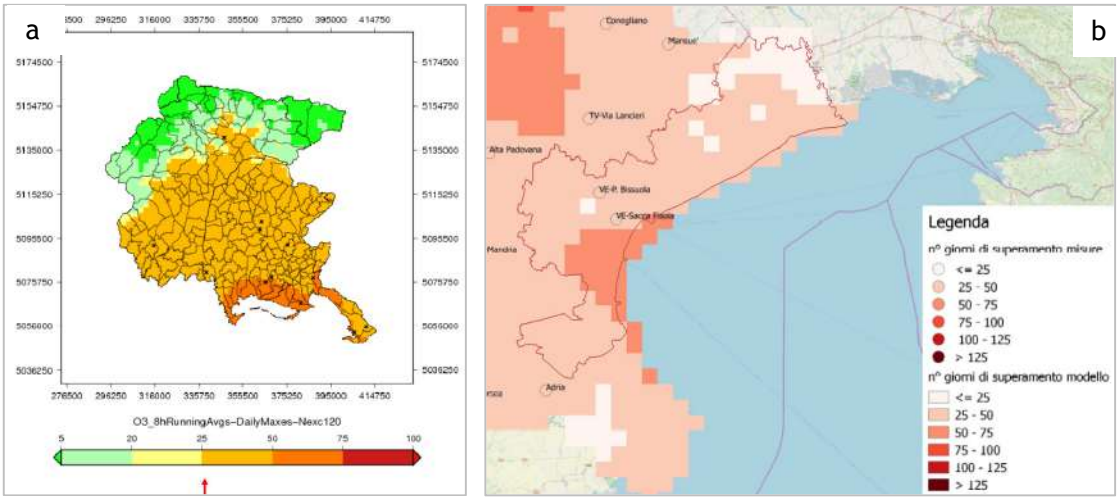


Figure 5.2: days of exceedance for 8-hour moving average in FVG Region (a) and Province of Venice (b). Sources: ARPA FVG and ARPAV Veneto

Current situation in Slovenia

Air pollution with **PM_{10}** was on average lower in 2020 than in previous years. The number of exceedances of the daily limit value for PM_{10} (50 ug/m³) surpassed the allowed number of exceedances (35) only at one monitoring site in mainland Slovenia. The annual limit value for PM_{10} and **$PM_{2.5}$** particles was not exceeded at any monitoring site. Lower concentrations of PM in the air are attributed to favourable meteorological conditions that prevailed in the winter period of the year. These allow the dilution of emissions from small combustion plants and traffic, which are the main sources of PM_{10} particles emissions in Slovenia (ARSO, 2021 [ZR08]).

With respect to **SO_2** the improvement of the situation in the last decade is a result of the use of low-sulphur fuels in industry and the operation of desulphurisation facilities in thermal power plants (ARSO, 2021 [ZR05]).

In the urban environment **nitrogen oxides (NO_x)** concentrations exceed the limit value for the protection of the vegetation (ARSO, 2021 [ZR06]). Long-term targets have been exceeded at almost all measuring sites. Especially worrying concentrations of ozone in 2019 were found in rural areas (ARSO, 2021 [ZR07, ZR10]).

Emissions of total ozone precursors in Slovenia decreased by 55% in the period 1990 to 2018. Emissions of NO_x decreased by 53%, CO by 68%, NMVOCs by 51% and NH_3 by 24%. The reason is mainly the introduction of more stringent emission standards for motor vehicles. This measure contributed to a significant reduction in emissions of nitrogen oxides and carbon dioxide from road transport which is the main source of ozone precursors. Emissions of NO_x and NMVOCs were in 2018 below the prescribed target values (ARSO, 2021 [ZR07, ZR10]).

Projections show a reduction in SO_2, NO_x, NMVOC, NH_3 and $PM_{2.5}$ emissions by 2030, mainly due to more strict legislation and implementing several sectoral policy measures. For $PM_{2.5}$, NMVOC and SO_2 emissions in 2030 are predicted to be only slightly lower than their targets, so there is a possibility that targets will not be met (ARSO, 2021 [ZR14]).

Assessment of the development according to the zero alternative

Environmental aspect	Indicators	Last available data and description of trend	ZA
Air pollution	Average emission levels of the main air pollutants (NOx, PM10, PM2,5, O3, SO2)	IT* (2020): Most air pollutants comply with legal limits and show a decreasing trend. There are still problems relating to PM_{10} (in the basin of Po and at altitudes below 200 m), to Ozone (widespread) and, locally, also to Benzopyrene; for these last pollutants the trend is stationary (SNPA, 2020)	↗↔
		SL PM10 complying with legal limits and stable, the other pollutants improving, due to more strict legislation and implementing several sectoral policy measures (ARSO, 2021 [ZR14])	↗↔

↑ Improving trend; ↗ Partially or gradually improving trend; ↔ Unchanged trend; ↘ Partially or gradually deteriorating trend; ↓ Deteriorating trend

5.2 Climate

Climate change is a key environmental, economic and social challenge globally and in Europe. On the one hand, most economic activities are contributing to climate change by emitting greenhouse gases or affecting carbon sinks; on the other hand, all ecosystems, many economic activities and human health and well-being are sensitive to climate change (EEA, 2019).

Climate change is happening. Several climate variables, including global and European temperatures and sea level, have repeatedly broken long-term records in recent years. Climate change has substantially increased the occurrence of climate and weather extremes, including heat waves, heavy precipitation, floods and droughts. The adverse impacts and risks are expected to intensify as the climate continues to change. To limit the adverse effects of climate change, strong mitigation and adaptation measures are needed (EEA, 2019).

EU greenhouse gas emissions have decreased by about 22 % in the past 27 years due to the combined result of policies and measures and economic factors. The carbon and energy intensity of the EU economy is lower now than it was in 1990 because of improvements in energy efficiency and the use of less carbon-intensive fuels, especially renewable energy sources. Transport remains one of the biggest challenges ahead to decarbonising the economy (EEA, 2019).

While the EU is on track to achieve its 2020 targets on greenhouse gas emissions and renewable energy, progress on the energy efficiency target remains insufficient. Rising energy consumption trends and recent greenhouse gas projections from MS indicate that the EU is not yet on track towards its 2030 climate and energy targets. Significant reductions are needed to achieve the EU's objective of an 80-95 % reduction in greenhouse gas emissions by 2050 (EEA, 2019).

Climate change adaptation is increasingly mainstreamed in EU policies, programmes, strategies and projects. The magnitude and pace of future climate change, and thus the long-term adaptation challenges, depend on the success of global mitigation efforts to keep the increase in global temperature to well below 2 °C compared with pre-industrial levels and to pursue efforts to limit the increase to 1.5 °C, as stated in the Paris Agreement (EEA, 2019).

5.2.1 Climatic factors

Current situation in Italy

Among greenhouse gas emissions in Italy CO_2 accounts for 81.2% of total CO_2 equivalent emissions (Romano *et. al* 2021), followed by CH_4 (10.3%), N_2O (4.1%), HFC_s (4%) and others less relevant (PFCs, SF6, NF3). CO_2, CH_4 and N_2O emissions decreased in the period between 1990 and 2019, respectively of 22.7%, 12.9% and 33.9%, while HFCs show a strong increase in emissions (from 0.4 to 16.8 Mt in CO_2 equivalent), a meaningful increasing trend that will concern in the next years. Overall, the total Italian greenhouse gas emissions, have decreased from 519 to 418 Mt CO_2 equivalent (-19,4%) between 1990 and 2019, excluding emissions and removals from LULUCF (41 kt CO2 eq. in 2019).

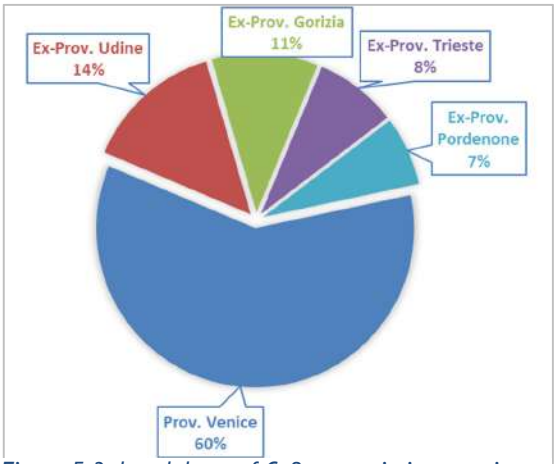


Figure 5.3: breakdown of Co2 eq. emissions eq. in 2015 in the Programme area. Processing Archidata on ISTAT data.

However, the reduction in emissions only began in 2005 and continued until 2014, after which Italy entered a period of stability.

The Programme area contributes with more than 20 equivalent Mt, considering only the three main GHGs (CO2, CO_2, CH_4 and N_2O) and excluding removals. The main sources are traffic and industrial and non-industrial combustion (about 68%).

Within the Programme area there are great differences between territorial areas: in particular, the Province of Venice alone, in 2015, emitted more than the entire Friuli Venezia Giulia Region (Fig. 5.3). According to INEMAR data, the province of Venice is also the one that emits more CO_2 in its entire Region (34% of the total CO_2 emissions of Veneto, in 2017).

	1990	1995	2000	2005	2010	2015
Prov. Venice	14.953,07	14.324,74	18.035,26	18.494,72	10.931,69	14.164,87
CH_4	791,53	696,59	742,26	615,03	359,01	295,94
CO_2	13.077,10	13.155,10	16.803,19	17.479,38	10.294,33	13.582,44
N_2O	1084,44	473,05	489,80	400,30	278,35	286,49
Prov. Udine	4.377,40	3.853,05	3.752,07	3.854,74	4.685,53	3.347,43
CH_4	691,35	610,84	507,83	583,49	352,77	436,49
CO_2	3.388,14	2.899,97	2.935,17	2.962,23	4.083,46	2.656,20
N_2O	297,91	342,23	309,06	309,02	249,31	254,74
Prov. Gorizia	5.088,34	4.882,35	4.290,23	4.338,91	2.664,29	2.562,23
CH_4	119,81	112,85	84,81	96,94	74,88	61,48
CO_2	4.920,84	4.723,05	4.159,80	4.044,42	2.548,93	2.460,03
N_2O	47,70	46,44	45,63	197,54	40,47	40,72
Prov. Trieste	3.195,53	3313,44	2.409,63	3.696,02	3.254,21	1.991,18
CH_4	84,78	73,17	73,39	67,30	61,77	54,43
CO_2	3.074,67	3.193,18	2.291,79	3.585,65	3.153,58	1.901,51
N_2O	36,08	47,08	44,45	43,08	38,86	35,25
Prov. Pordenone	2.603,43	2.685,75	2761,16	2.584,17	2.653,20	1.663,98
CH_4	530,09	495,90	296,65	247,15	224,52	224,91
CO_2	1.919,16	2.011,80	2.252,39	2.133,05	2.234,08	1.273,89
N_2O	154,17	178,05	212,12	203,98	194,60	165,18
TOTAL	**30.217,77**	**29.059,32**	**31.248,34**	**32.968,56**	**24.188,93**	**23.729,69**

Table 5.1: emission of CO2 eq. (kt). Processing Archidata on ISTAT data.

Overall, the CO2 eq. in the Programme area had a strong contraction between 2005 and 2010 (Table 5.1 and Fig. 5.4), and the trends are favourable until 2015 for all the GHGs considered, in line with national trends.

In Italy, in 2019, were consumed 21,9 Mtep of Renewable Energy Sources (RES), correspond to 18,2% of the total energy consumption (GSE data). A figure that has been gradually increasing since 2005, when it accounted for 7,5% of the total energy consumption. Thanks to this trend, Italy was the first EU country to reach its "2020 overall target", which exceeds since 2014.

Considering only the transport sector, which has a specific Community objective, in 2019 RES covered 9% of energy consumption. A figure very close to the target (10%) and constantly growing from 2007, when it accounted only for 1%.

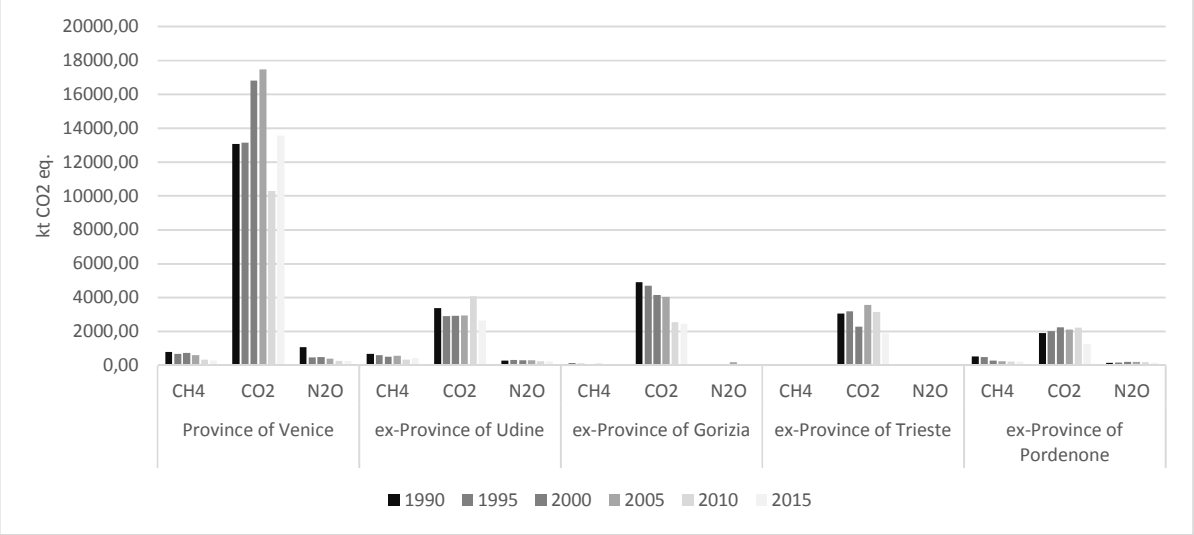


Figure 5.4: trend in emission of CO2 eq. (kt). Processing Archidata on ISTAT data

Within the national context, the contribution that the different regions are required to provide in order to achieve the national objective is various (as required by the Ministerial Decree 15/3/2012 "Burden sharing"). Veneto and Friuli Venezia Giulia regions represent virtuous examples that have positively contributed to the achievement of the objectives:

- in 2019 in both regions the RES target consumption forecast for 2020 has been exceeded and the total consumption has been respected. This means that the share of consumption covered by RES was greater than expected (+8% in Friuli Venezia Giulia, +3% in Veneto);
- both regions increased the share covered by RES compared to 2012: + 4,5% in Friuli Venezia Giulia and +1,5% in Veneto.

	Friuli Venezia Giulia					Veneto				
	RES energy consump. (ktep)*	Target RES	Gross final energy consump.(ktep)	Target Gross final	%	RES energy consump. (ktep)*	Target RES	Gross final energy consump.(ktep)	Target Gross final	%
2012	564		3.375		16,7	1.772		11.824		15,9
2013	591		3.406		17,3	1.905		11.371		16,7
2014	594		3.149		18,9	1.878		11.135		16,9
2015	641		3.269		19,6	2.017		11.661		17,3
2016	647		3.298		19,6	2.029		11.566		17,5
2017	662		3.357		19,7	2.056		11.662		17,6
2018	670	379	3.441	3.477	19,5	2.038	1.066	12.048	12.325	16,9
2019	665		3.328		20,0	2.055		12.343		16,6
2020		422		3.487			1.274		12.349	

*Transport sector excluded

Table 5.2: Energy consumption and regional targets. Source: GSE (2021).

The most important renewable energy source of electric sector on national level is hydropower with 41,1%, followed by solar photovoltaic (21%), wind (17%), bioenergy (13%) and geothermal energy (5%). In the programme region hydropower is more is more relevant than in the national context (55% in FVG, 48% in Veneto), as well as bioenergy (27% in FVG, 26% in Veneto), while wind power and geothermal energy practically disappear. Moreover, bioenergy sector is the only that have increased its importance in both regions, comparing the data of 2019 and 2013. Among other things, it should be considered that the province of Venice does not administer mountainous portions of the

territory and in fact contains only two hydroelectric plants of the 46 % in the Veneto Region; instead, there are numerous biomass/biogas and photovoltaic systems.

The most important renewable energy source of thermic sector on national level are solid biomass and heat pumps, while the other sources still make a minor contribution. The situation within the program region is similar, but since 2013 the energy produced with these sources has not grown, while among other sources it has done so significantly the energy obtained from the biodegradable fraction of the waste.

Current situation in Slovenia

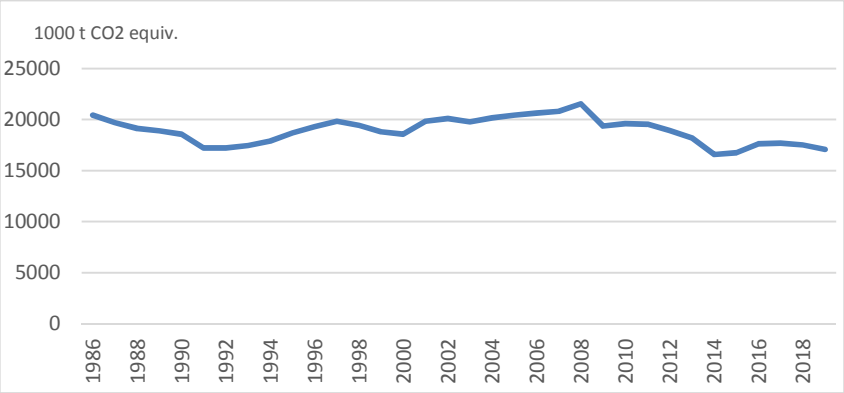


Figure 5.5: GHG emissions in Slovenia, 1986-2019. Source: ARSO, 2021 [PB03]

In Slovenia, GHG emissions in 2019 amounted to 17 million tons of CO2-eq, 8.2 tons per capita, which is 91.8% of emissions in the base year 1990 and 83.5% of emissions in the base year 2005. The majority of the emissions originates in the transport and energy industries (ARSO, 2021 [PB03]).

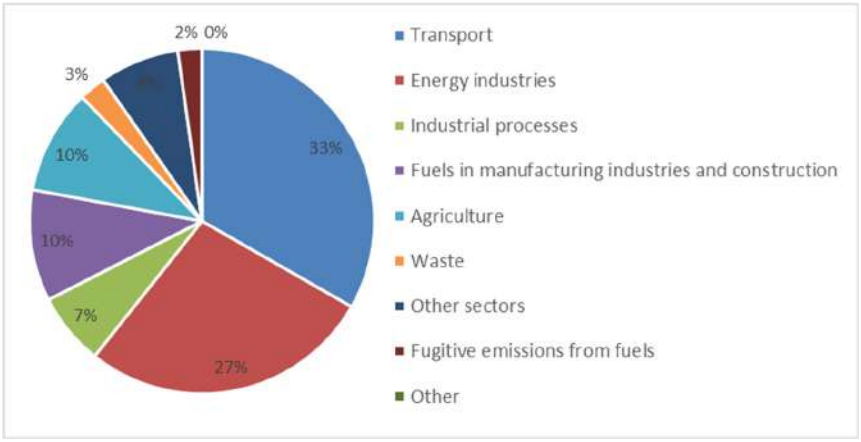


Figure 5.6: GHG emissions in Slovenia by sectors in 2018. Source: ARSO, 2021 [PB03]

In 2019, the share of energy from renewable sources in gross final energy consumption was 21.7%, which is 0.8 of percentage points higher than in the previous year. The share should be increased by a further 5.3 percentage points to achieve the national target of 27% by 2030 (ARSO, 2021 [EN24]; SURS, 2021).

In the heating and cooling sector, the share increased by 0.1 percentage points to 31.2%, in the electricity sector it increased by 0.3 percentage points to 32.6% and in the transport sector, it increased by 2.5 percentage points to 8%. The most important renewable energy source on a national level is hydropower (65%), followed by liquid biofuels (16%) and geothermal energy (9%) (ARSO, 2021 [EN24]; SURS, 2021).

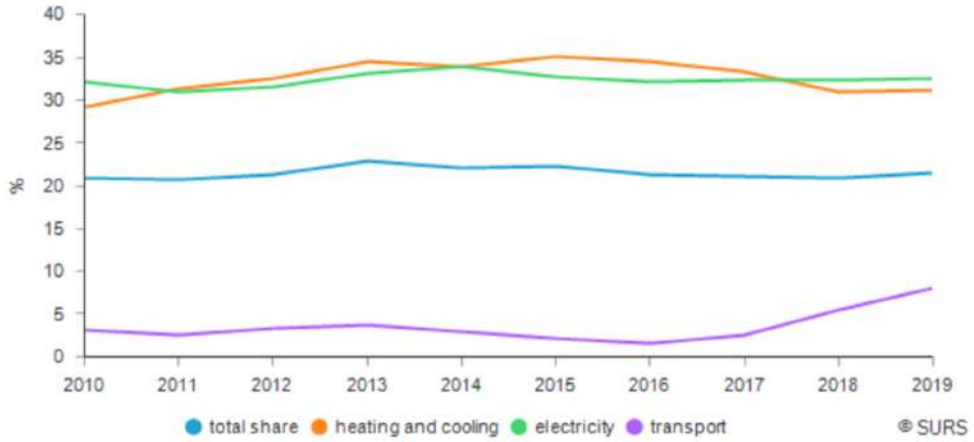


Figure 5.7: share of energy from renewable sources in gross final energy consumption in Slovenia. Source: SURS, 2021

In 2019, the final energy consumption amounted to 4,944,391 toe (207,012 TJ), and after four years of growth, it decreased by 2% compared to the previous year. There was a decrease in all sectors except the industry. In the period 2000–2019, the final energy consumption increased by 7.6%. Most energy, 40%, is consumed in transport, followed by industry (27%), households (21%) and other uses. The final energy consumption in 2019 was 4.5% lower than the target for 2020 (5,118 ktoe). Final energy consumption per capita in 2019 was 2.33 toe, which is 7% higher than the EU-28 average (ARSO, 2021 [EN10]; SURS, 2021).

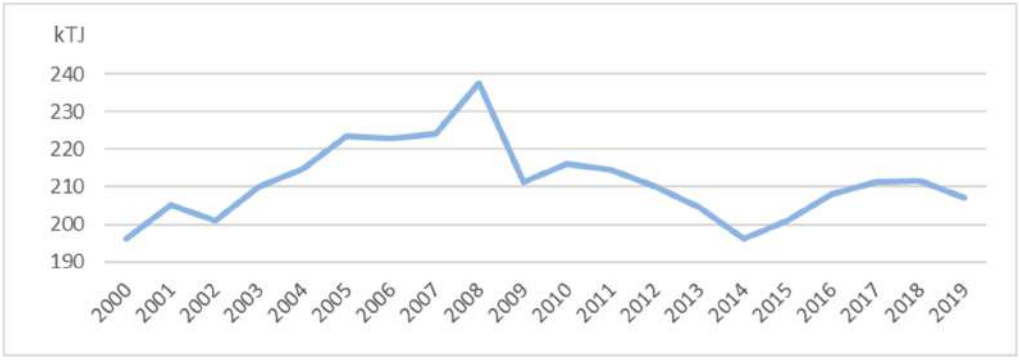


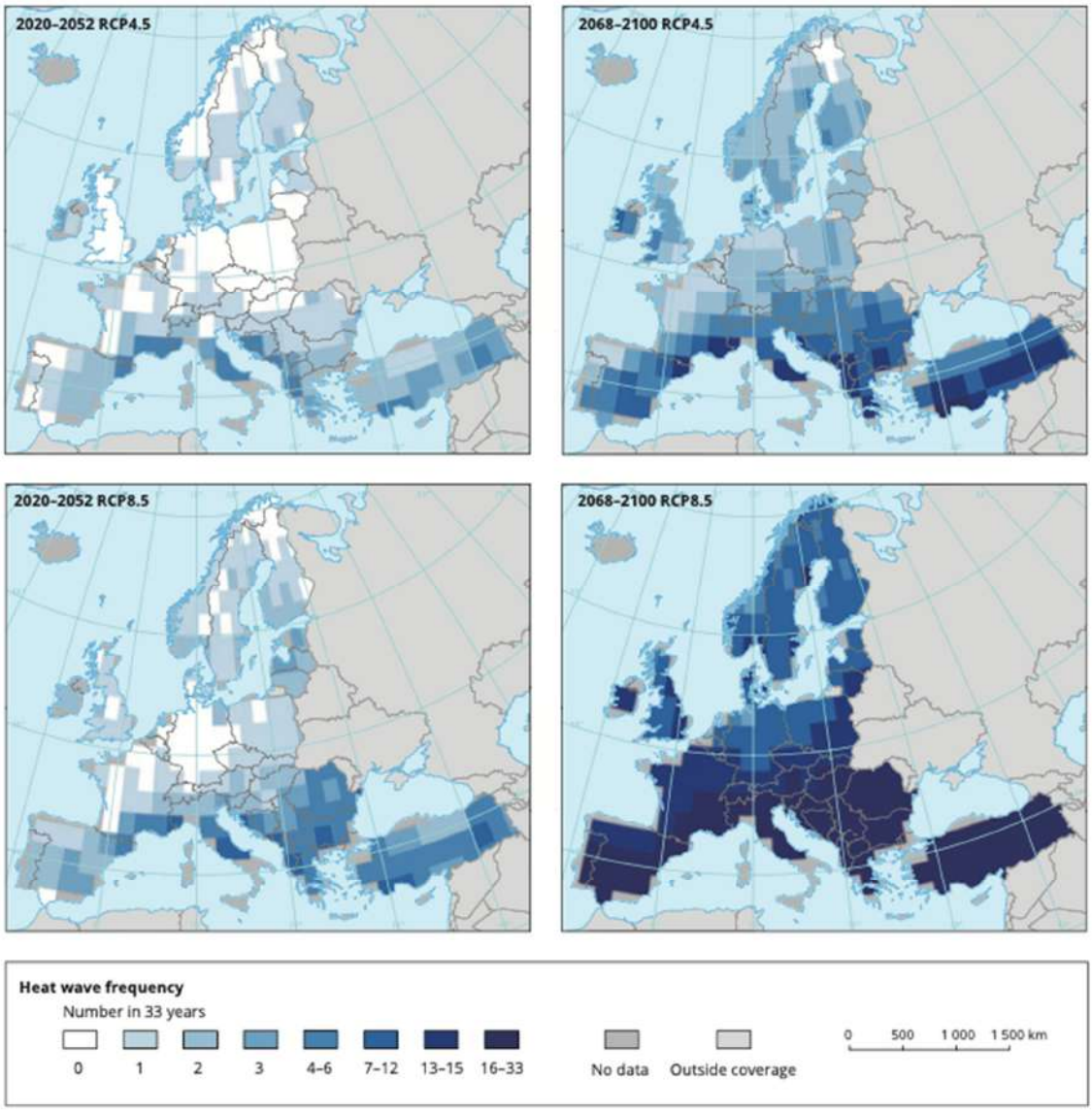
Figure 5.82: total final energy consumption (1,000 TJ). Source: SURS, 2021)

5.2.2 Climate change models and trends

Current situation in Europe and the programme area

Annually-averaged land temperatures in Europe have increased considerably faster than global average and daily maximum temperatures in Europe have increased much faster than annually-averaged temperatures. This means that a given increase in global mean temperature is associated with a much larger increase in heat extremes in Europe. Heat extremes and heatwaves have increased considerably since the 1950s, and in particular after 2000. Since 2015, all-time national temperature records were broken in eight EEA member countries and the national records for the warmest night, which is particularly relevant from a human health perspective, were broken in nine countries including Slovenia in 2017 (EEA, 2019).

Heatwaves are projected to become even more frequent and longer-lasting in Europe. Under the high-emissions scenario, very extreme heat waves (more severe than the 2003 heatwave affecting southern and central Europe) are projected to occur as often as every 2 years in the second half of the 21st century. The most severe economic and health risks from heatwaves are projected for low-altitude river basins in southern Europe and for the Mediterranean coasts, where many densely populated urban centres are located. See figure below for details (EEA, 2019).

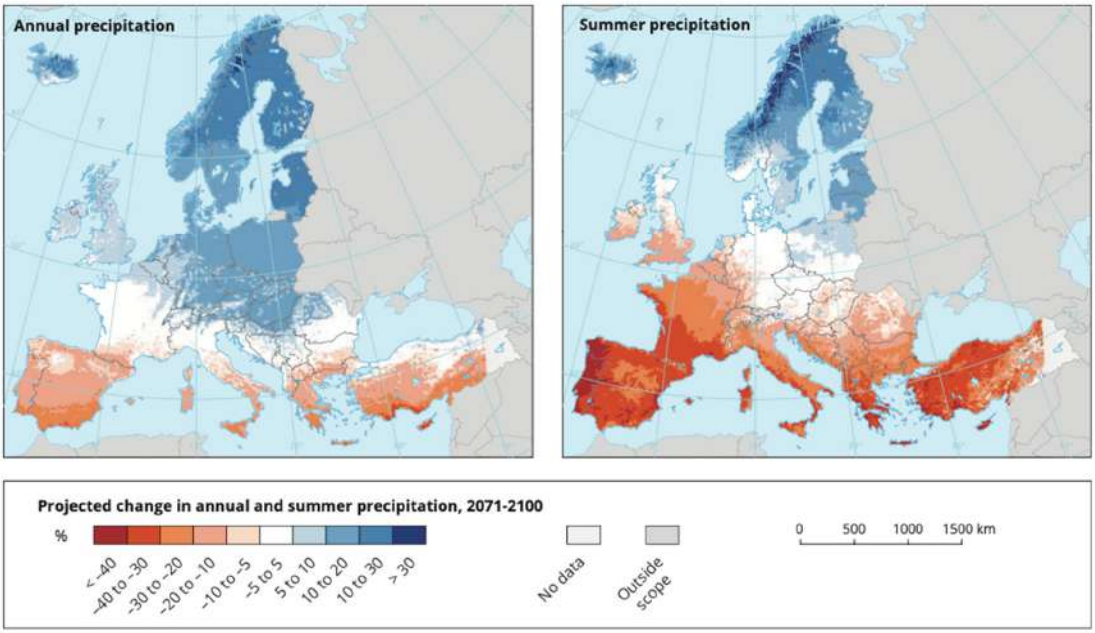


Note: RCP 4.5 corresponds to a medium-emissions scenario, whereas RCP 8.5 refers to a high-emissions scenario. Neither of these scenarios is compatible with the stabilisation target of the Paris Agreement.

Figure 5.93: future extreme heatwaves predicted under two high-emission scenarios. Source: EEA, 2019

Just as importantly, observed and projected changes in precipitation in Europe vary substantially. Generally, annual precipitation has increased in most parts of northern Europe and decreased in parts of southern Europe and these changes are projected to exacerbate in the future with continued climate change. The figure below illustrates the predicted annual trends and trends in the summer growing season (EEA, 2019).

Although projected rainfall patterns do not show extensive deviations from the current overall annual precipitation patterns, they suggest decreased summer precipitation in southern Europe – thus, northern Italy and Slovenia may be particularly affected by meteorological droughts especially during the summer periods. However, for other seasons, an increased precipitation is predicted, accompanied by more frequent pluvial floods and flash floods in the programme area (EEA, 2019).



Note: Projected changes in annual (left) and summer (right) precipitation (%) in the period 2071-2100 compared with the baseline period 1971-2000 for the forcing scenario RCP 8.5, which corresponds to a high-emissions scenario, based on the average of a multi-model ensemble of regional climate models.

Figure 5.104: projected changes in annual and summer precipitation (EEA, 2019)

A changing climate is affecting a wide range of economic sectors and human activities, including agriculture, forestry, fisheries, water management, coastal and flood protection, energy, transport, tourism, construction, and human health and wellbeing (e.g., an increase in heat-related mortality and vector-and waterborne diseases has been observed across Europe). The overall economic impacts of climate change on Europe are primarily negative but there is substantial variation across regions and economic activities. Ciscar et al. (2014) have estimated that southern and central-southern Europe is projected to suffer by far the highest losses as a percentage of GDP in Europe – amounting to 4 per cent reductions in GDP in southern European countries (Croatia, Italy) and 2,5 per cent of GDP loss in Austria, Czechia, Slovakia and Hungary. Economic and welfare losses in southern and central Europe are dominated by health-related impacts - increased mortality from heatwaves in particular, but also due to reduced labour productivity (Ciscar et al, 2014).

Assessment of the development according to the zero alternative

Environmental aspect	Indicators	Last available data and description of trend	ZA
Climate	Greenhouse gas emissions	IT* (2015): Considering only the three main GHGs (CO2, CO_2, CH_4 and N_2O) and excluding removals, more than 23 equivalent Mt were emitted. The main sources are traffic, industrial and non-industrial combustion (about 68%). Overall, the trends were favourable until 2015 for all the GHGs considered. However, it should be considered that the Province of Venice (which emits more than all Friuli Venezia Giulia) has increased its emissions in the last considered years.	↔ ↘
		SI (2019): Total GHG emissions in 2019 amounted to 17 million tons of CO2-eq, 8.2 tons/capita (Target value for 2030: 20% decrease compared to 2005 for Slovenia). Amount of GHG emissions in 2019 present 91.8% of emissions in the base year 1990 and 83.5% of emissions in the base year 2005.	↗
	Final energy consumption	IT*(2019): Regional data indicate total consumption equal to 3.328 ktep for the entire FVG and 12.343 for the entire Veneto. The trend is stable or slightly increasing, but however the limits imposed by the law have been respected.	↔
		SI (ARSO, 2021; SURS, 2021): 22% (2019) (Target value for 2030: 27%) In 2019, the share was 2.2 percentage points higher than in 2005.	↗
		IT*(2019): Regional data indicate renewable energy consumption	↗

	Share of renewable energy in gross final energy consumption	equal to 665 ktep for the entire FVG and 2.055 ktep for the entire Veneto. The RES target consumption forecast for 2020 had already been exceeded in 2019. The share of total energy consumed from renewable sources reached 19% in FVG and 17% in Veneto. The trend is growing for both Regions.	
		SI (ARSO, 2021; SURS, 2021): 207,012 TJ/year or 4,944 ktoe/year, 2.3 toe/year/capita (2019) (Target value for 2030: final energy consumption must not exceed 4,717 ktoe). In 2019 final energy consumption decreased by 2% compared to the previous year, after four years of growth.	↗
↑ Improving trend; ↗ Partially or gradually improving trend; ←→ Unchanged trend; ↘ Partially or gradually deteriorating trend; ↓ Deteriorating trend			

Programme area only

5.3 Water

In the context of European policy, surface water ecosystems are defined as rivers, lakes, and transitional and coastal waters. In addition, many wetlands such as floodplains, bogs and mires depend on the availability of water for their existence (EEA, 2019).

Currently only 40% of Europe's surface water bodies achieve good ecological status and wetlands are widely degraded, as are 80-90 % of floodplains. This has a critical impact on the conservation status of wetland habitats and the species that depend on them. Although point source pollution, nitrogen surpluses and water abstraction have been reduced, freshwaters continue to be affected by diffuse pollution, hydro-morphological changes and water abstraction. Diffuse pollution and water abstraction pressures are expected to continue in response to intensive agricultural practices and energy production. This requires balancing societal demands for water with ensuring its availability for nature. Climate change is likely to change the amount of water available regionally, increasing the need for either flood protection or drought management and making this balance more difficult to achieve. Improved implementation and increased coherence between EU water-related policy objectives and measures is needed to improve water quality and quantity. Looking ahead it will also become increasingly critical to address and monitor the climate water-ecosystem-agriculture nexus and connection with energy needs.

Marine life is still under pressure across Europe's seas. Multiple pressures affect species and habitats, leading to cumulative impacts that reduce the overall resilience of marine ecosystems.

The target for designation of marine protected areas has been met. At the same time, the target of achieving good environmental status of European marine waters by 2020 have not been achieved in relation to key pressures such as contaminants, eutrophication, invasive alien species and marine litter (EEA, 2019).

5.3.1 Internal surface water

Current situation in Italy

The most recent available data for Italy refers to 2010-2015 (ISPRA, 2021; SNPA, 2018). In those years, 7.841 surface water bodies (7.494 rivers and 347 lakes) and 1.052 underground water bodies were monitored, distributed in eight river basin districts (the Programme area is included in the Eastern Alps District). The quality objective of the ecological status was achieved only in 43% of the rivers and in 20% of the lakes. Best results were provided by the chemical state, which saw the achievement of the objective of good state in 75% of the rivers and 48% of the lakes.

In the specific Programme area: for the Province of Venice data are available for two periods: 2011-2013 and 2014-2016. In the latter, none of the 54 monitored water bodies achieved good ecological status, 2 (3,7%) were in "poor" ecological status and the rest were in a "sufficient" status. The comparison with the previous period shows a general improvement (32% of water bodies were in poor state and 9% in bad state) even if the good status of 4 water bodies was lost. With respect to chemical state, 100% of the water bodies have reached the good state; a remarkable improvement over the previous period, when 11% of water bodies were in a bad state.

In Friuli Venezia Giulia region, more recent data are available pertaining to the 2014-2019 period. During these years the monitoring of river water bodies has been carried out through a total of 328

sampling stations for the ecological status and 200 for the chemical status. From an ecological point of view, about half of the regional water bodies (47%) are registered as good quality; a further 7% reaches the high quality status, while 46% are in an unsatisfactory state of conservation (30% moderate, 9% poor, 7% bad); in the mountain area, among the most significant impacts there are those deriving from the presence of hydroelectric power plants, while in the plains those due to interventions, often invasive, to trivialize the watercourse for agricultural and water resources exploitation. The ecological status has worsened compared to the period from 2010 to 2015, when 9% of water bodies were in high quality status and 34% in good status; the amount of water bodies in an unsatisfactory state was lower (27% moderate, 8% poor, 4,5% bad), but only for the high percentage of water bodies not classified yet. Regarding the chemical state, almost all the water bodies classified (91%) were found to be in good condition; in the previous period all water bodies were found in good chemical state, but the share of unclassified water bodies was very high (44%), and this makes it difficult to identify a trend[4].

Current situation in Slovenia

In Slovenia, 98.7% of surface water bodies are in a good chemical condition. That means two water bodies are in poor chemical condition due to the excess of metals and only one of them is located within the programme area. Still, as elsewhere in Europe, all surface water is polluted with mercury and brominated diphenylethers. Good or better ecological status is estimated for 49% of surface water bodies. The main reasons for the moderate or poor ecological status of surface waters are hydro-morphological change and general degradation, which are evaluated based on the status of benthic invertebrates and fish communities. Compared to the previous assessment period, good ecological status is achieved by 10% fewer water bodies due to better monitoring methods (ARSO, 2021 [VD12]).

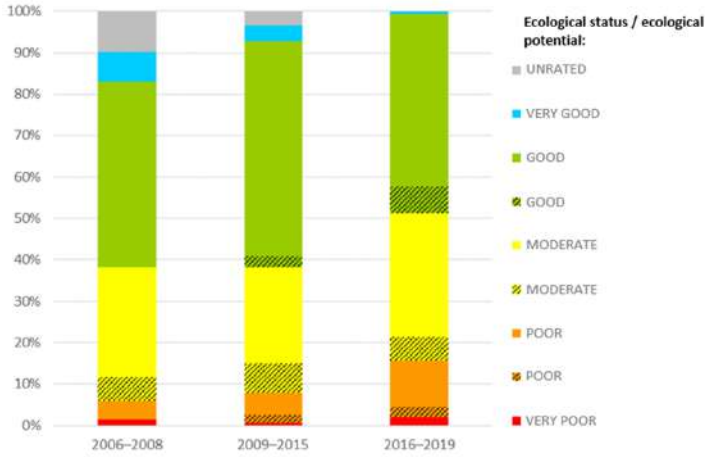


Figure 5.115: surface water bodies in individual classes of ecological status (percentage). Source: ARSO, 2021 [VD12])

In Slovenia, nutrient overloading is still the basic problem concerning lakes and reservoirs, and from 2006 to 2019, no improvement is observed. In the assessment period 2016-2019, only 4 out of 11 lake water bodies were determined to be in good or very good trophic status. Overloading of lakes with phosphorus is usually a result of inadequate wastewater drainage and intensive agriculture in the watershed area (ARSO, 2021 [VD07]).

Inland bathing water quality in Slovenia is good and comparable with bathing water quality in other European countries (ARSO, 2021 [VD09]).

Considering the water runoff, the above-average years 2013 and 2014 were followed by average and below-average annual runoff. In the period 1961-2019, the driest years were 2011, 2007, 2003, 1983, and 1971. In the year 2019 annual runoff was average. The long-term slight downward trend of river runoff from the territory of Slovenian currently persists (ARSO, 2021 [VD03]).

[4] www.arpa.fvg.it/cms/tema/acqua/acque-superficiali-interne/Stato_Ambientale_Fiumi/Classificazione-2014-2019.html , accessed 20th October 2021.

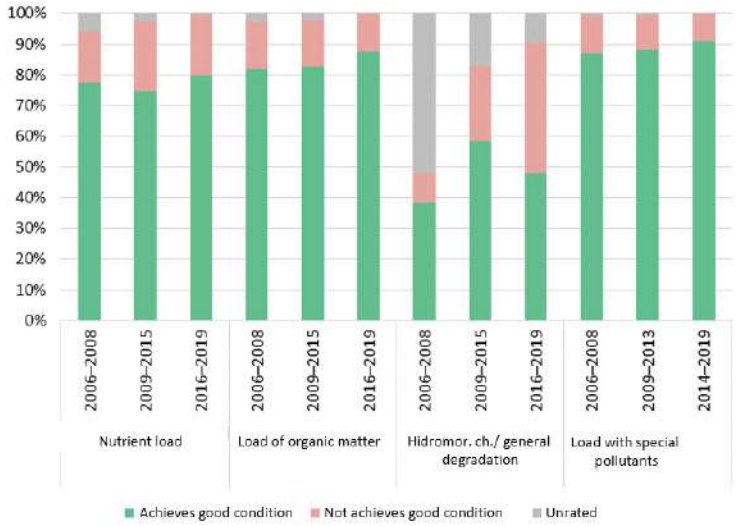


Figure 5.126: surface water bodies that achieve/do not achieve good ecological status according to individual loads (percentage). Source: ARSO, 2021 [VD12])

5.3.2 Transition and marine water

Current situation in Italy

Most recent data for Italy (2010-2016) show a context of important compromise of both the ecological and chemical status of the Italian coastal lagoons. The situation is very heterogeneous according to the area considered, but 3 out of 7 districts have no water body in a satisfactory ecological state and the most ecologically qualitative district (i.e Central Apennines) has only 50%. Looking at the chemical state, districts with water bodies in good condition are just 3 (ISPRA, 2021).

In the specific of the Programme area: in the Province of Venice (data available for the period 2014-2016), none of the 13 assessed water bodies are in a satisfactory state. In the Venice lagoon, 3 water bodies were classified as "sufficient" and 7 as "poor"; the latter is the state also for the lagoons of Caorle and Baseleghe. Hypoxia phenomena are widespread, less nitrogen pollution. The trend is reported by ARPAV Veneto as stable compared to the period 2010-2013. With respect to the chemical state, only the Caorle lagoon is in good condition, while the other 15 water bodies assessed are all in a not good status. Mercury and brominated diphenyl ethers are among the most widespread pollutants that have caused this status. According to ARPAV the regulatory changes do not allow to detect a trend from the comparison with the previous period.

In Friuli Venezia Giulia (available data: 2009-2014 and 2014-2019), just 3 out of 17 water bodies are classified in good ecological status (all included in Grado lagoon), 7 as sufficient and 7 in poor status, which means a slight deterioration compared to the previous period (10 water bodies in sufficient and 4 in poor status). The chemical state assessment registers only Isonzo river mouth in good condition, and the other 18 water bodies in a not sufficient status, due to mercury and brominated diphenyl ethers. This is a remarkable deterioration compared to the previous period, when 9 out of 17 water bodies were classified in good condition.

In addition to the classic quality indicators, ISPRA also dedicates specific indicators for the Venice lagoon, because its economic, cultural and ecological importance. Climate change represents nowadays a tangible threat: this is related to cases of high tide, which have become increasingly intense in recent years and particularly evident since 2009. As for the temperatures, the anomalies over the period between 1986 and 2019 are constantly growing and in 2019 was measured a deviation of the minimum temperatures of almost +3°C and +1.5°C for maximum. In the period between 1872 and 2019 the average sea level increased by an average of 2,53 mm per year.

Most recent data on marine water for Italy (2010-2016), but limited to the ecological status[5], show that only 54% of the water bodies has been considered with satisfactory quality. Nonetheless, the

[5] In SNPA (2017) data are summary data are provided only broken down by river basin district. The district of interest, that of the Eastern Alps, shows a condition comparable to that of the other districts of Northern Italy; the central Apennines and Sardinia are in much better conditions, while for southern Italy (including Sicily) the amount of information is very scarce.

situation in the Programme area appears to be better off than the National average: in Friuli Venezia Giulia all the monitored water bodies (19) were found in good ecological status in 2014-2019, confirming the assessment of the previous period (2009-2014). in Province of Venice in 2019 three water bodies were in good status and two in sufficient status, where the water bodies in the worst conditions are those at the mouth of Adige. In the Province of Venice, the trend is uncertain — with particularly negative years (2014, 2016) interspersed with more positive years (2018) — but stable overall (SNPA, 2019).

Regarding the chemical status of the coastal marine waters in the Programme area, the situation is more critical: in Friuli Venezia Giulia all the monitored water bodies (19) are in non-good ecological status during the period 2014-2019, while 14 water bodies were found to be in good ecological status in the previous period (2009-2014). In the Province of Venice in 2019 all the monitored water bodies (5) are in non-good ecological status, with a negative trend that began in 2016 and has been confirmed in subsequent years.

Despite this, the bathing quality of the waters remains good along almost all the coasts of the Programme area: in the period from 2016 to 2019, in Friuli Venezia Giulia of the 78 km of coastline, 98% is in satisfactory quality status (94% in high quality status and 4% in good status), while in Veneto 98,5% of the 101 km of coastline, (96% in high quality status and 2,5% in good status), and both Regions show no water bodies in bad status (SNPA data, 2021).

Current situation in Slovenia

All marine water bodies are considered to be in a good chemical as well as ecological condition according to the Water Management Plan, based on the monitoring period of 2014-2019 (ARSO, 2021b; MOP, 2021). Still, the coast is very heavily modified, only approximately 34% of the coast is left in a semi-natural condition. Other threats and problems remain to be the agricultural pollution in the river basins that run into the sea, as well as the industrial pollution to the surface water and the pollution from the treatment plants (MOP, 2021). There are few transitional waters in Slovenia, and they are monitored together with running or marine waters.

5.3.3 Ground water

Current situation in Italy

In 2010-2015 more than 1.000 water bodies have been monitored in Italy, and the chemical status was classified as good in 57,6% of cases and poor in 25% (the remainder not classified), while the quantitative state registered 60,8% of good cases and 14,4% of poor (ISPRA, 2021).

With reference to the Programme area, in the Province of Venice (2019) 33 out of 43 monitored wells registered a poor quality classification; the greater number of exceedances of the threshold values is due to the presence of inorganic pollutants (32 attributable to ammonium ion) and arsenic (8), mainly of natural origin. Data 2015-2019 show a remarkable stability. As regards the quantitative status of underground water bodies, the monitoring did not reveal any critical situations, in line with the last decade trend.

In Friuli Venezia Giulia (data 2009-2014), the chemical assessment registers 26 water bodies in good status and 11 in poor (one not classified). No previous data are available to define a temporal trend.

Current situation in Slovenia

In the third water management plan for the period 2022-2027, a poor chemical status is determined for three water bodies composed of aquifers with intergranular porosity, however, they are all outside of the programme area (ARSO, 2021 [VD11]). The rest of the water bodies are in a good chemical condition.

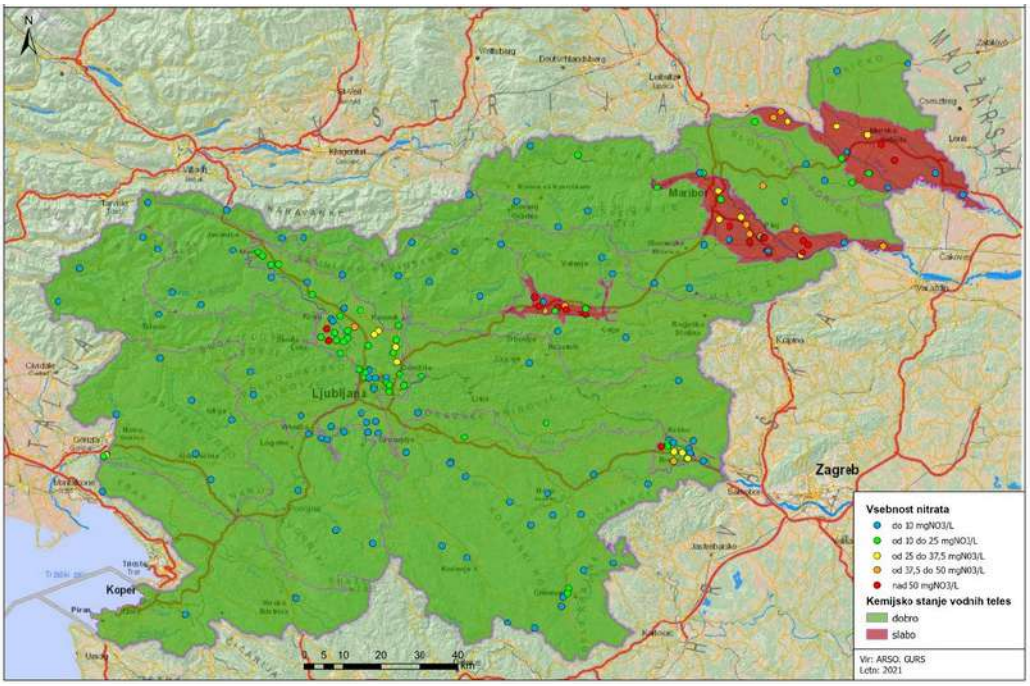


Figure 5.13: chemical status and average annual values of nitrate in groundwater samples at the sampling points of the Slovenian national monitoring in 2020. Soiurce: ARSO, 2021 [VD05])

The groundwater in karst and fractured aquifers is less burdened with nitrates due to geographical conditions, low population density and less agricultural land. In the period 1998-2020, the average annual levels of nitrates in water bodies in the Sava valley and Ljubljana marsh show a statistically significant downward trend (ARSO, 2021 [VD05]).

Water protection areas cover 3,532 km^2 or 17,4% of Slovenia's land surface in 2021. This is a slight increase, compared to 2017, but the goal of protecting the areas of all water sources for public water supply with a regulation on a national level has not been reached yet (ARSO, 2021 [VD16]).

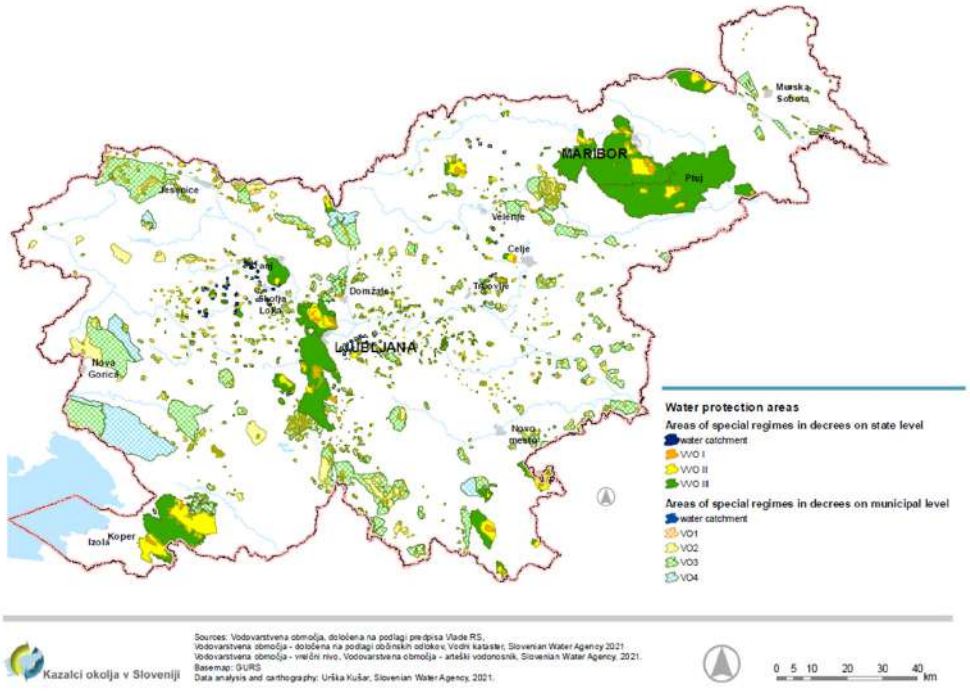


Figure 5.14: water protection areas in Slovenia, 2021. Source: ARSO, 2021 [VD16])

In Slovenia, 93% of inhabitants are included in a public service for drinking water. In 2020, drinking water monitoring was carried out in supply zones (water supply systems) that supply 50 or more persons (94% of the population). Large and medium supply zones that supply more than 1,000 (85%) of the population, generally have adequate drinking water quality. The most problematic are small supply zones that supply 50-500 people, which are the least monitored and are more likely to get contaminated due to the lack of disinfection processes. Supply zones with surface and karst water resources (especially in Karst and Gorenjska region) are also more vulnerable to contamination. In 2020, the chemical and microbial monitoring of drinking water was not carried out on smaller supply zones with altogether 96,518 residents. Overall, in zones where monitoring was performed, 94% of taken samples were in suitable microbiological condition. As far as the chemical monitoring is concerned, there were a few exceedances of limit values for the pesticide desethyl-atrazine (1,130 people exposed), and aluminium, manganese and iron. In the period 2004-2019, the quality of drinking water has improved, mainly due to decrease in nitrates and pesticides (ARSO, 2021 [VD08]).

The total renewable amount of groundwater in shallow aquifers in Slovenia in the hydrological year 2019 was below the average of the comparative hydrological water balance period 1981-2010 (ARSO, 2021 [VD15]). However, annual averages fluctuate and no characteristic trend can be defined.

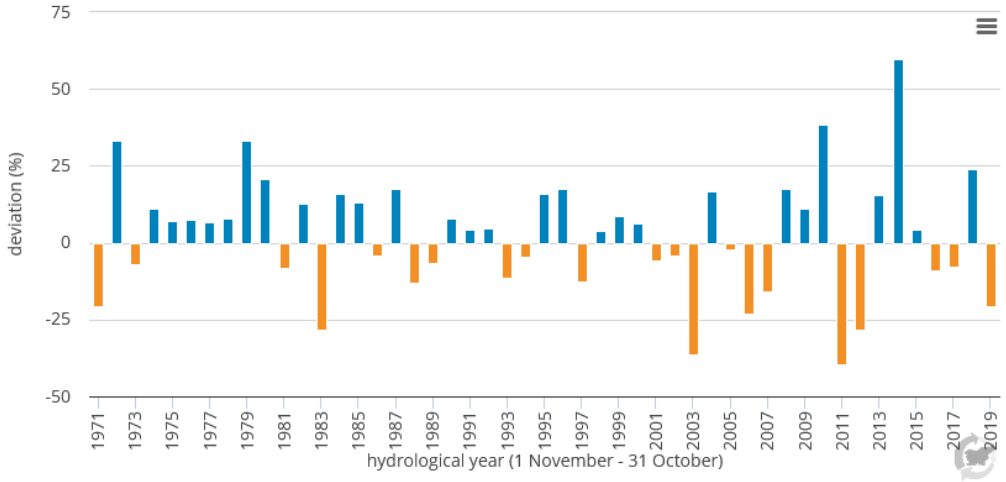


Figure 5.157: deviation of quantitative groundwater recharge in shallow aquifers of Slovenia by individual hydrological years from the average of the hydrological water balance period 1981-2010. Source: ARSO, 2021 [VD15])

Assessment of the development according to the zero alternative

Environmental aspect	Indicators	Last available data and description of trend	ZA
Surface water	Ecological status of surface water bodies	IT*: Less than half of the surface water bodies reach the good state of conservation. The trend is generally worsening. Only 3 out of 30 transitional water bodies achieve good ecological status. The trend is slightly worsening. 22 of the 24 marine waters investigated are in good ecological status. In this case the trend is stable	↘ ↔
		SI (ARSO, 2021): 98.7% of surface water bodies are in good chemical condition. Good or better ecological status is estimated for 49% of surface water bodies. Compared to the previous assessment period, good ecological status is achieved by 10% fewer water bodies. Nutrient overloading is still the basic problem concerning lakes and reservoirs. In the period 2016-2019, no improvement is observed (only 4 out of 11 lake water bodies in good or very good trophic status)	↘ ↔
	Chemical status of surface water bodies	IT*: All surface water bodies are in good chemical state. The trend is stable. The opposite for transitional and marine waters, with almost all water bodies not reaching good status. The trend is worsening in both types. Despite this, the bathing ability of the waters remains good along 98% of the coasts of the Programme area, although the trend is slightly worsening	↔ ↘
Ground water	Chemical status of ground water bodies	IT*: 68% of water bodies are in good status. The trend, this is stable.	↔
		SI (ARSO, 2021): All water bodies in good chemical condition.	↔
	Quantitative status	IT*: More than 85% of water bodies in good status. No data to provide a trend.	↔

	of ground water bodies	SL (ARSO, 2021): All water bodies in a good quantitative condition. The total renewable amount of groundwater in shallow aquifers below the average of the comparative hydrological water balance period 1981-2010. But no significant long-term trend detected	↔

↑ Improving trend; ↗ Partially or gradually improving trend; ↔ Unchanged trend; ↘ Partially or gradually deteriorating trend; ↓ Deteriorating trend

5.4 Soil and land use

Soil and land represent a universal natural capital - not only due to its food production capacities, but also due to many other ecosystem services they provide to nature and mankind. Currently, soils across Europe suffer from sealing, erosion, compaction, pollution, salinization and carbon loss. Additional pressure on the land system comes from climate change. Shifting spring phenology, droughts, fires, storms and floods impact the condition of ecosystems and the food chain. As the demand for food and the pressures on land and soil are increasing on a global scale, ensuring sustainable land-use management is becoming a major priority (EEA, 2019).

Land take and soil sealing continue, predominantly at the expense of agricultural land, reducing its production potential. While the annual rate of land take and consequent habitat loss has gradually slowed, ecosystems are under pressure from fragmentation of peri-urban and rural landscapes. Soils, with the help of various organisms, filter and buffer contaminants in the environment. Industrial activities, waste disposal and intensive land management have led to the dispersal of contaminants throughout the environment and eventually to their accumulation in soils. Sources of contaminants include the residues of plant protection products, industrial emissions, mineral fertilisers, biosolids (some composts, manures and sewage sludges), wood preservatives and pharmaceutical products. Soil contamination can be diffuse and widespread or intense and localised (contaminated sites). Contaminants include heavy metals, persistent organic pollutants, residues of plant protection products and others. Depending on soil properties and their concentrations, contaminants in soil may enter the food chain, threaten human health and be toxic to soil-dwelling organisms (FAO and ITPS, 2017). Substances that are not readily degradable will eventually leach into surface and groundwaters or be dispersed by wind erosion (Silva et al., 2018) (EEA, 2019).

5.4.1 Land use and soil sealing

Current situation in Italy

	Land use classes				
	1	2	3	4	5
Prov. of Gorizia	13,0	48,0	19,1	3,6	16,2
Prov. of Pordenone	8,5	41,4	47,4	0,0	2,8
Prov. of Trieste	25,9	17,0	57,0	0,0	0,2
Prov. of Udine	6,3	36,2	54,0	0,2	3,3
Prov. of Venice	11,2	66,0	0,7	4,6	17,5
Programme area	8,7	44,6	38,3	1,4	7,1

1 = Artificial surfaces; 2 = Agricultural areas; 3 = Natural terrestrial areas; 4 = wetlands; 5 = rivers and lakes

Table 5.3: variation of land cover classes between 2012-2017 (Percentage values referring to the class). Source: Munafò & Marinosci, 2018 (ISPRA national land cover map)

Figure 5.16: land cover according to the first CLC level. Source: Archidata on ISPRA data (2018)

According to the data provided by the latest SNPA report (Munafò, 2021), 48% of Italian soil is covered by natural surfaces, 45% by herbaceous or tree crops and 7% by artificial surfaces. Arable crops (30% of the total area) and broad-leaved trees (27%) dominate in particular. The water bodies

cover only 1.3% of the territory. Therefore, in Italy the area dedicated to agriculture and natural surfaces is in line with the European one, while artificial surfaces occupy a relative greater portion of the territory (+ 3%) which is to the detriment of water bodies and wetlands.

Referring to the Programme area, a report is offered in the figure above. The natural surfaces cover 47% of the territory, even if the water bodies assume greater importance than at national level (thanks to the great contribution of the lagoons of Venice and Grado and Marano). Artificial surfaces are present to a slightly greater extent than in the rest of the country. The division of the classes seems to be rather clear, with the natural terrestrial areas concentrated above all in the mountain portion of the ex-provinces of Pordenone and Udine, as well as on the Karst. The most anthropized province is that of Venice, in which 76% of the territory is used for artificial surfaces or agricultural crops.

In recent decades, the Italian landscape has seen numerous changes linked to different predisposing factors of a prevalently socio-economic nature, which are reflected in two apparently antithetical phenomena: soil sealing and forest expansion. The increase in forests is in fact inversely related to population density and in fact has occurred, so far, mainly in the high-hilly and mountainous belt. At the same time, anthropogenic pressure has increased significantly in the flat areas and along the coasts, with processes of agricultural intensification and expansion of urbanized areas (Munafò & Marinosci, 2018). Similar changes are taking place in the Regions of the Programme Area, albeit to a lesser extent than in the rest of the country.

	Artificial surfaces	Natural surfaces not vegetated	Woods	Shrubs	Herbaceous vegetation	Waters and wet-lands
Veneto	1,33	0,90	1,88	2,27	-1,69	-0,22
Friuli Venezia Giulia	1,18	0,54	1,57	2,53	-2,51	-1,22
Italy	1,09	-0,53	4,70	-10,18	-3,96	-1,05

Table 5.4: variation of land cover classes between 2012-2017 (Percentage values referring to the class). Source: Munafò & Marinosci, 2018 (ISPRA national land cover map)

The growth of artificial areas highlights the problem of soil sealing, understood as the transformation of natural and agricultural surfaces into artificial ones.

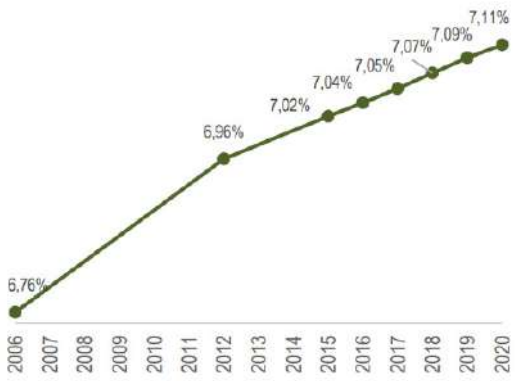


Figure 5.17: percentage of soil consumption in Italy (Munafò, 2021)

According to the most recent national data, in 2020 another 51,7 km^2 of non-anthropic soil have been lost (9,8 km^2 for permanent consumption) net of the compensations due to renaturalization. The artificialization rate of the available surfaces is in line with the recent past, albeit slightly slowing compared to the 2006-2012 period (see Figure 5.17). In 2020 the soil was consumed at a rate of 14,2 hectares per day, the same as the previous year (Munafò, 2021).

The relationship between soil sealing and the dynamics of population is not direct, i.e it occurs even in the absence of the demand mechanisms that generally justify the request to soil sealing: the 51,7 km^2 of land were sealed in the face of a decrease in population of about 175 thousand inhabitants; this means that for each less inhabitant, 292 m^2 of land was sealed.

Friuli Venezia Giulia and Veneto are among the Italian regions with the worst soil seal indicators in 2020. In particular, Veneto is the second Region for absolute value of soil sealed (+685 hectares) and the first for density of soil sealed (3,72 m^2/ha). Friuli Venezia Giulia sealed little land in an absolute sense (65 hectares) but ranks second for soil sealing per capita (525 m^2/inhabitant). In Veneto was sealed 1250 m^2 of land for each less inhabitant (the worst value in Italy) and in Friuli Venezia Giulia too soil sealing occurred despite a decline in the resident population (155 m^2 of land for each less inhabitant).

The trend of annual soil sealing is very variable, even if both Regions have had a peak of artificialization around 2016-2017 (about +1200 hectares in Veneto; about +300 hectares in Friuli Venezia Giulia) following which a constant reduction is being observed.

	Soil sealing (ha)	Soil sealing (%)	Per capita soil sealed (m2/inhab) in 2020	Soil sealing density (m2/inhab/year)
Province of Gorizia	2	+0,03	445	0,35
Province of Pordenone	10	+0,05	614	0,45
Province of Trieste	3	+0,08	189	1,61
Province of Udine	50	+0,15	640	1,01
Province of Venice	56	+0,16	418	2,26
Italy	5.175	+0,24	359	1,72

Table 5.5: soil sealing indicators. Variations 2020 compared to 2019. Source: Munafò, 2021

The previous table shows the available indicators for the provinces included in the Programme area. Ex-provinces of Trieste and Gorizia. Remember that the Ex-provinces of Gorizia and Trieste and the Province of Venice have a percentage of already sealed soil which is well above the national average.

In Italy to date (Araneo & Bartolucci, 2021) the contaminated sites amount to 4.689 (1,5 every 100 km^2), of which 62 in Friuli Venezia Giulia (0,8 sites every 100 km^2) and 350 in Veneto (1,9 sites every 100 km^2). There were 41 sites of national interest in 2019, a slight increase from 2013 (when they were 39). Two of these are located in Friuli Venezia Giulia (Trieste and Caffaro) and one in the Province of Venice (Porto Magrhera). The “Trieste” site extends for 1.196 ha at sea and 435 ha on land and covers the area affected by horbour activities in the Gulf of Trieste. The "Caffaro di Torvicosa" site covers 201 hectares of land and includes an area of the Lagoon of Marano and Grado polluted by Mercury. Both of these sites were established in 2001 and they have recently been redesigned and circumscribed. The "Venice (Porto Margera)" site was established in 1998 and covers 1618 ha of land and is attributable to the harbour industrial areas, polluted by metals (arsenic, chromium, mercury, nickel), polycyclic aromatic hydrocarbons (PAHs) and organo-chlorinated compounds; it has been downsized following its establishment too (Araneo & Bartolucci, 2021).

The soil degradation indicator represents the sum of different degradation processes. On a national level, more than 70.000 km^2 (equal to about 25% of the territory) have one cause of degradation, more than 14.000 km^2 (over 4,5% of the territory) have been degraded by two factors while more than 1.600 km^2 by three causes. In total, about 89% of national territory have been degraded. In the period 2012-2019, Veneto is the second region that has increased the percentage of degraded surface the most, also because this indicator is highly correlated with soil sealing (Araneo & Bartolucci, 2021).

Current situation in Slovenia

Based on Corine Land Cover data, more than half of Slovenia’s land area was covered by forests (56 % or 58 % including shrubland) in 2018, while other mostly natural vegetation accounted for 3 %. Farmland occupied 34 % of the land area, while slightly less than 4 % (70,908 ha) was artificial land, and less than 1% was water. It is important to note that artificial areas increased by 598 ha in the period 2012-2018 and agricultural areas decreased to almost the same extent – 504 ha (ARSO, 2021 [TP01]).

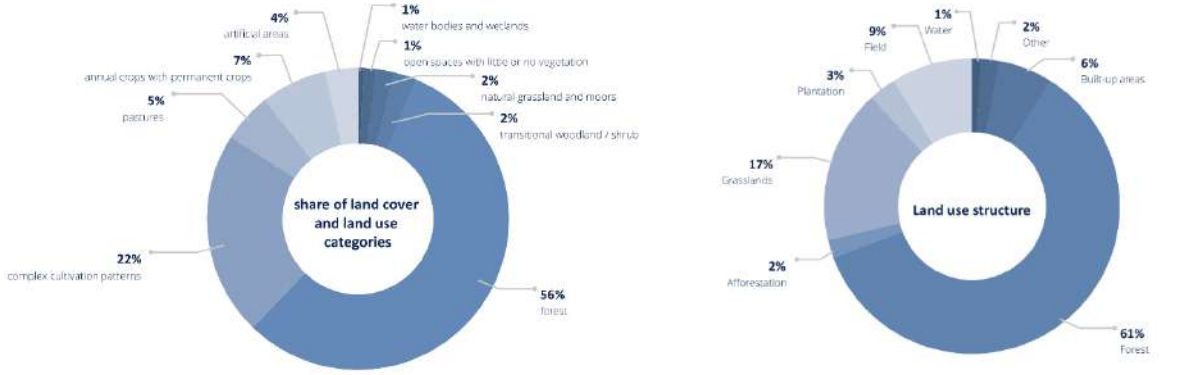


Figure 5.18: share of land cover and land use categories (a) and land use (b) in Slovenia in 2018 based on Corine Land Cover data. Source: ARSO, 2021 [TP01 and TP03]); MKGP, 2019

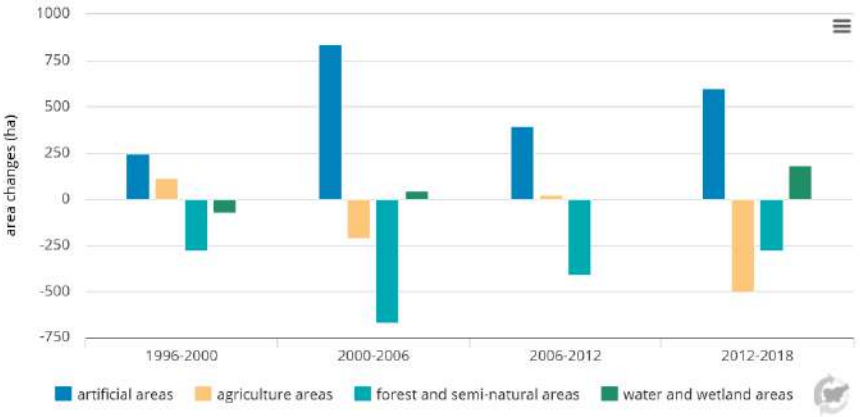


Figure 5.19: changes in the total area of land cover categories for Slovenia for periods 1996-2000, 2000-2006, 2006-2012, 2012-2018 (Corine Land Cover data). Source: ARSO, 2021 [TP01]

According to the land use data, provided by the Ministry of Agriculture, Forestry, and Food, 61 % of Slovenia's land was covered by forest, followed by grasslands (17 %) and fields (9 %) while the build-up areas represented 6 % (113,129 ha) of the land in 2019 (ARSO, 2021 [TP03]; MKGP, 2019).

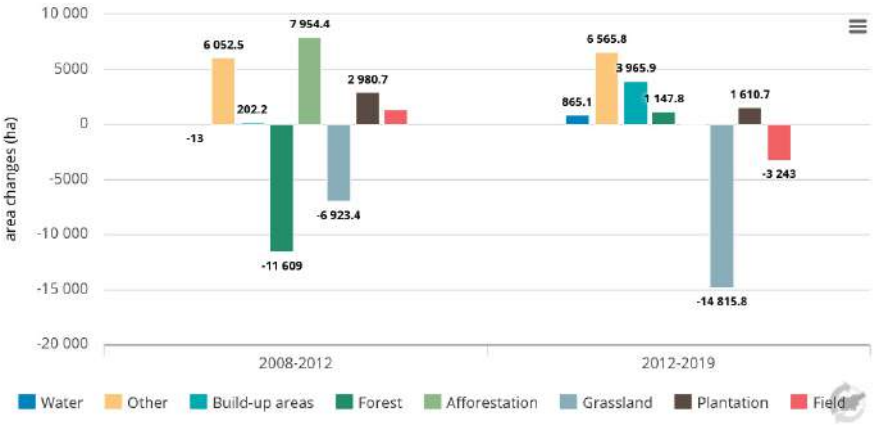


Figure 8.20: land use changes 2008-2012 and 2012-2019. Source: MKGP, 2019; ARSO, 2021 [TP03])

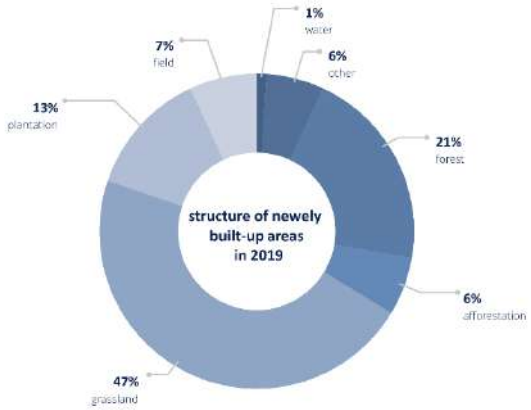


Figure 5.21: structure of newly built-up areas in 2019 (MKGP, 2019; ARSO, 2021 [TP03]

As shown in the Figure above, there was an evident land-use change in the period 2012-2019 that resulted in a decline in grasslands, an increase in built-up areas, and also a decline in fields (ARSO, 2021 [TP03]).

In the period between 2012 and 2019, built-up areas have in most cases replaced grasslands (47 %), forests (21 %), and permanent crops (13 %). The total area of built-up areas increased by 3,966 ha (ARSO, 2021 [TP03]).

In 2020, Slovenia recorded a slight increase in the number and total area of functionally depreciated areas (FDAs): 1 132 FDAs were recorded in the total area of 3 695.3 ha. Compared to 2017, their number increased by 51, with a total area of 272.5 ha. There is an evident lack of a systematic approach to environmental remediation and restoration, especially of those FDAs where old environmental burdens are present, as well as the establishment of a spatial development system that will tend to "no net land take" of agricultural and forest land (ARSO, 2021 [TP02]).

5.4.2 Soil quality and soil pollution

Current situation in Italy

Soil quality can be understood in many ways; one of these is the content on organic matter. In Italy it is estimated that about 1,67 Pg of organic carbon are stored in the volume of soil corresponding to the first 30cm; higher values are observed in areas characterized by greater rainfall, with predominantly calcareous lithologies and in wooded areas. Conversely, lower values occur in areas characterized by higher temperatures, clayey lithologies and in agricultural areas. The critical value for the fertility of agricultural soils is set at around 1%; it's estimated that about 80% of Italian soils have a CO content of less than 2% (Munafò, 2021).

In the Programme area, the quantification of organic carbon seems to differ depending on the authority that produced the estimation, making the results not entirely comparable. Nonetheless, in most of the Friuli Venezia Giulia's plain the endowment is in the 1-2% range, with negative exceptions in the gravellier sectors of the high plain (<1%) and positive (2-4% or more) in some areas where the decomposition of the litter is made slower by the particular soil environment (humid soils adjacent to the lagoon and in the limestone soils of the Karst)[6]. In the Province of Venice most of the soils fall into the 0-1% and 1-2% classes, with a few exceptions of more humid soils south and northeast of the city of Venice.

Another aspect of soil quality is that of soil erosion. In Italy, erosion is mainly due to water flow, while wind erosion can be considered negligible. This problem strongly affects the country, which in 2010 was the first in the EU for loss of eroded soil (8,46 t/ha, while European average is 2,46). In the Programme area the portions of the territory most subject to erosion are those in which agricultural activity is still present in the hilly and mountainous areas, especially where the surfaces are used for arable land or vineyards. The lowland areas, on the other hand, present a low or zero risk of erosion (MATTM, 2016).

Salinization is another threat to soil quality, being associated with compaction and desertification. Part of the Programme area is also affected by this problem: salinity (whose threshold is defined t a4 mS/cm) was found in the province of Gorizia with a value of about 10 mS/cm. In Veneto, a recent published salinity map highlights 58 thousand hectares of coastal territory affected by faint to high salinity, about half of these are located in the Province of Venice, concentrated in the two clusters of Southern Lagoon and around the Canale del Nicesolo (faint saline soils). The problem worsened in

[6] http://www.arpa.fvg.it/export/sites/default/tema/suolo/pubblicazioni/12_Qualita_del_suolo.pdf, accessed 20th October 2021.

last decades due to the strong drainage of the aquifers and climatic changes that led to higher evapotranspiration[7].

Desertification represents the final stage of soil degradation processes. The most recent national assessment estimates that 10% of the national territory is very vulnerable, 49% medium and 26% low or not vulnerable. The Italian regions with the largest percentage of the territory subjected to medium-high risk are the central-southern ones, while Veneto and Friuli Venezia Giulia are included in the 7-25% class, albeit slightly increasing in last decade (MATTM, 2016).

With regard to the pollution of sediments, soils and subsoils, reference is made to the National register of contaminated sites, defined as all those areas in which an alteration of the qualitative characteristics of an entity representing a risk for human health has been ascertained. In Italy the contaminated sites amount to 4.689 (1,5 per 100 Km2), 62 in Friuli Venezia Giulia (0,8 sites per 100 Km2) and 350 in Veneto (1,9 sites per 100 Km2). There were 41 sites of national interest in 2019, a slight increase from 2013 (when they were 39). Two of these (Trieste and Caffaro di Torvicosa, both officially classified as contaminated in 2001) are located in Friuli Venezia Giulia and one in the Province of Venice (Porto Marghera, classified in 1998). The former extends for 1196 ha at sea and 435 ha on land and covers the area affected by harbour activities in the Gulf of Trieste. The Caffaro di Torvicosa site covers 201 hectares of land and includes an area of the Lagoon of Marano and Grado. The Porto Marghera site covers 1618 ha of land attributed to the harbour industrial areas, polluted by metals (arsenic, chromium, mercury, nickel), polycyclic aromatic hydrocarbons (PAHs) and organo-chlorinated compounds (Araneo & Bartolucci, 2021).

Current situation in Slovenia

In general, the soil in Slovenia is well-supplied with organic matter. 86.2 % of the agricultural land contains more than 2 % of organic matter, and 30.9 % of the land contains more than 4 %. The results of laboratory analyses of soil samples taken in 2005 exhibited a similar picture: 88.6 % of samples contained more than 2 % of organic matter and 37.3 % of samples contained more than 4 % of organic matter. This relatively good condition of the soil is a result of the grassland being the prevailing land cover of the agricultural land, and that arable land and permanent crops are relatively abundantly fertilized with the livestock manure. All goals concerning soil quality in Slovenia remain to be descriptive, as quantitative goals are not defined (ARSO, 2021 [KM17]).

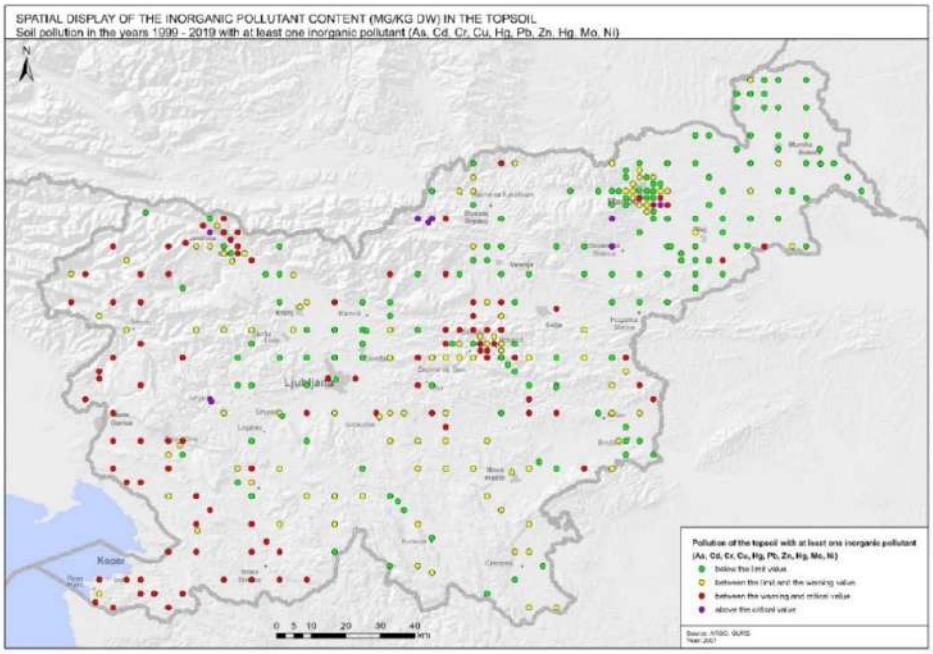


Figure 5.22: soil pollution in the years 1999-2019 with at least one inorganic pollutant detected (As, Cd, Cr, Cu, Hg, Pb, Zn, Hg, Mo, Ni). Source: ARSO, 2021 [TP04]

[7] http://geomap.arpa.veneto.it/layers/geonode%3Acarta50_250_salinita_UTS1, accessed 21st October 2021

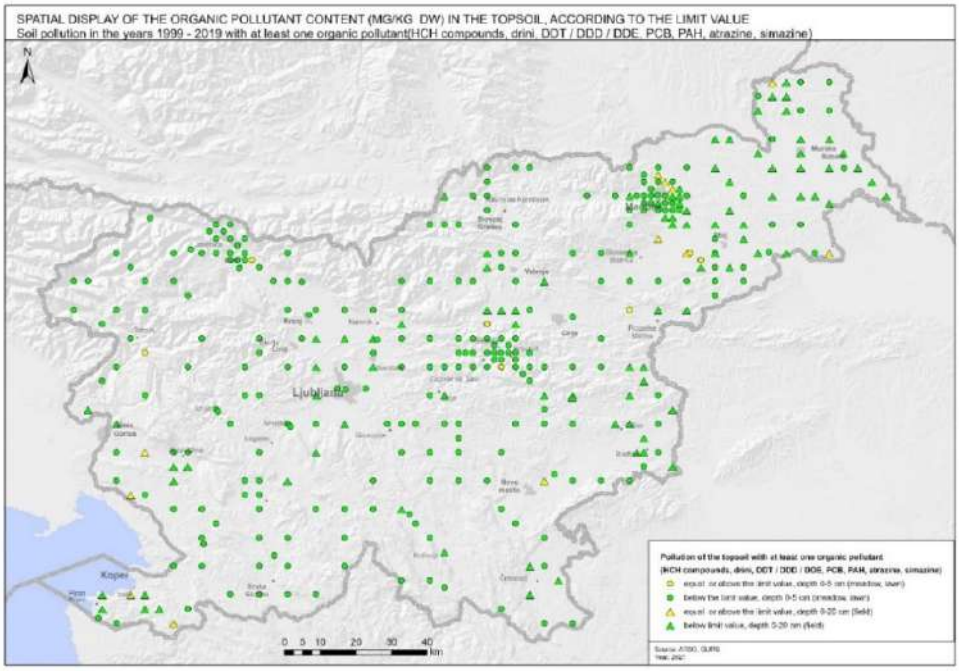


Figure 5.23: soil pollution in the years 1999-2019 with at least one organic pollutant detected (HCH compounds, drini, DDT/DDD/DDE, PCB, PAH, atrazine, simazine). Source: ARSO, 2021 [TP04]

The research on soil pollution shows that soils in Slovenia, with some exceptions, are not heavily polluted. In 42 % of topsoil samples taken in the period from 1999 to 2019, no exceedances of limit values for dangerous substances were detected. In 56 % of samples, the limit values for inorganic pollutants were exceeded, and in 5 % the limit values for organic pollutants. As seen in the Figure below, most unsuitable soil samples with inorganic pollutants were taken in western Slovenia (predominant pollutants being cadmium and mercury). The most polluted areas with inorganic pollutants were Jesenice, Idrija, the Celje Basin, and the Upper Mežica Valley (ARSO, 2021 [TP04]).

Soil erosion is a threat to Slovenian soil. Maximum average annual soil water erosion is among the highest in Europe with 7,43 t/ha per year. Soil water erosion on the agricultural land and grasslands is the highest among EU countries with 15 t/ha per year (Eurostat, 2020). According to the erosion map for Slovenia, approximately half of the programme area is considered to be affected by the soil water erosion, however, the lack of data accuracy remains a challenge. Soil in the programme area is either not affected by desertification or shows a low sensitivity to desertification (EEA, 2017). Soil salinization is not discussed in the field and therefore appears not to be a threat to soils in Slovenia.

Assessment of the development according to the zero alternative

Environmental aspect	Indicators	Last available data and description of trend	ZA
Soil and land use	Land take	IT: The area is mainly covered by agricultural soils (44% of the total) followed by a consistent share (38%) of terrestrial natural areas. The artificial surfaces have reached a coverage of over 8% of the territory. In recent decades, the landscape has seen numerous changes linked to factors of a prevalently socio-economic nature: in less populated areas cultivated fields are replacing woods and shrubs, while in the plains there is an increase in artificial areas ARPA FVG & ARPAV Veneto, 2020).	↘
		SI: In period 2012-18, built-up areas were predominantly spread to grasslands (47%), forests (21%) and permanent crops (13%). Their total volume increased by 3,97 ha. Share of built-up areas in Slovenia in the year 2006 amounted 2.74% and increased to 3.52% until 2018. Slight increase in the number and total area of FDAs is recorded (ARSO, 2021).	↘
	Land use/cover change by categories	IT: In the last year, 750 hectares of land have been taken in Veneto and Friuli Venezia Giulia together. Both Regions had a peak in artificialization around 2016-2017 (about +1200 hectares in Veneto, about +300 hectares in Friuli Venezia Giulia) and a following constant reduction is observed (negative trend). The land-take is not related to the resident population, which is reducing (ISTAT, 2019-2020).	↘

		SI: In 2018, more than half of Slovenia's land area was covered by forests (56% or 58% including shrubland), while other mostly natural vegetation accounted for 3%. Farmland occupied 34% of land area, while slightly less than 4% (70,908 ha) was artificial land, and less than 1% was water. There is characteristic trend of decrease of agricultural areas and increase of built-up areas in Slovenia (ARSO, 2021).	↘
	Area of functionally degraded areas	IT: Contaminated sites amount to 4.689 (1,5 sites per 100 km^2), of which 62 in Friuli Venezia Giulia (0,8 per 100 Km^2) and 350 in Veneto (1,9 per 100 km^2). (Araneo & Bartolucci, 2021)	↘
		SI: In 2020, Slovenia recorded a slight increase in the number and total area of functionally depreciated areas (FDAs): 1 132 FDAs were recorded in the total area of 3 695.3 ha. Compared to 2017, their number increased by 51, with a total area of 272.5 ha (ARSO, 2021).	↘
	Quality of soil and soil pollution	IT: Soil quality notion is manifold. The organic matter content presents critical values (<1%) or close to it (1-2%) in a large part of the plain; various coastal areas are affected by secondary salinization; a non-negligible portion of the territory is subject to medium-high risk of desertification. For all these indicators it is difficult to quantify a trend, even if it is acquired that concomitance of climate change and anthropogenic exploitation worsen the situation. (MATTM, 2016 and ARPA-ARPAV)	↘
		SI: Relatively good condition of soil is due to predominance of grassland in the composition of agricultural land and that arable land and permanent crops are relatively abundantly fertilized with livestock manure. Systematic research on soil pollution shows that soils in Slovenia, with some exceptions, are not heavily polluted (ARSO, 2021).	↔
↑ Improving trend; ↗ Partially or gradually improving trend; ↔ Unchanged trend; ↘ Partially or gradually deteriorating trend; ↓ Deteriorating trend			

5.5 Biodiversity and natural heritage

The EU Birds and Habitats Directives constitute the backbone of Europe's legislation on nature conservation, but despite ambitious targets, Europe continues to lose biodiversity. Assessments of species and habitats protected under the Habitats Directive show predominantly unfavourable conservation status at 60% for species and 77% for habitats. Biodiversity loss is not confined to rare or threatened species. Long-term monitoring shows a continuing downward trend in populations of common birds and butterflies, with the most pronounced declines in farmland birds (32%) and grassland butterflies (39%) (EAA, 2020).

There has been progress in some areas, such as the designation of protected areas: the EU Natura 2000 network now covers 18 % of the EU's land area and almost 9 % of marine waters, making it the world's largest network of protected areas. Europe's biodiversity and ecosystems face cumulative pressures from land use change, natural resource extraction, pollution, climate change and invasive alien species. These have a severe impact on ecosystem services (EEA, 2020).

5.5.1 Species

Current situation in Italy

In the European context, Italy boasts the highest level of biodiversity, hosting 58.000 animal species (1/3 of the total amount in Europe) and over 6.700 vascular plants (half of the European total amount); 20% of terrestrial and freshwater animal species, and over 16% of the vascular flora are endemic or subendemic. All this represent an excellence, due to the varied physical conditions (lithology, topography and climate), to the geographical position (in the centre of the Mediterranean basin, one of the 33 biodiversity hotspots in the world), to its paleogeographic history, and also to the historical use of the territory by man. In addition, Italy hosts over 30% of the recognized species of European Union interest (Ercole *et al.*, 2021).

As a matter of fact, the Programme area represents a very important portion for this species: the geographical position is at the intersection of three biogeographical districts, characterized by different chorology, with an extraordinary environmental heterogeneity (Alps, Pre-Alps, hills, high and low plains, resurgence belt, Karst, coastal cliffs and lagoons). All this is reflected in habitats and communities (both animals and, above all, plants) of great conservation interest and characteristics for the national context (see Fig. 5.14 and 5.15).

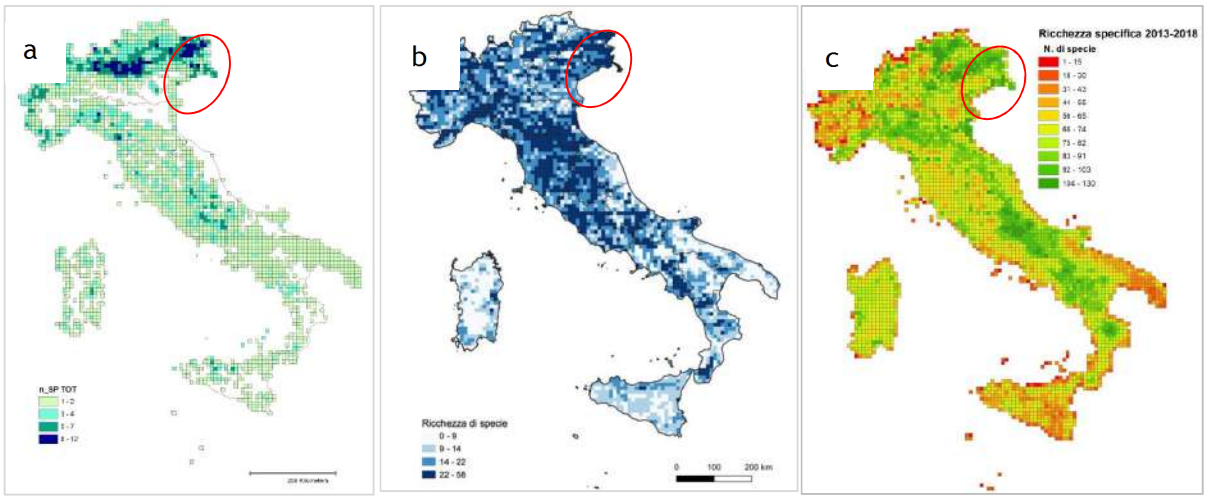


Figure 5.24: flora (a), fauna species (b) and birds (c) of European interest. Source: Ercole et. Al (2021)

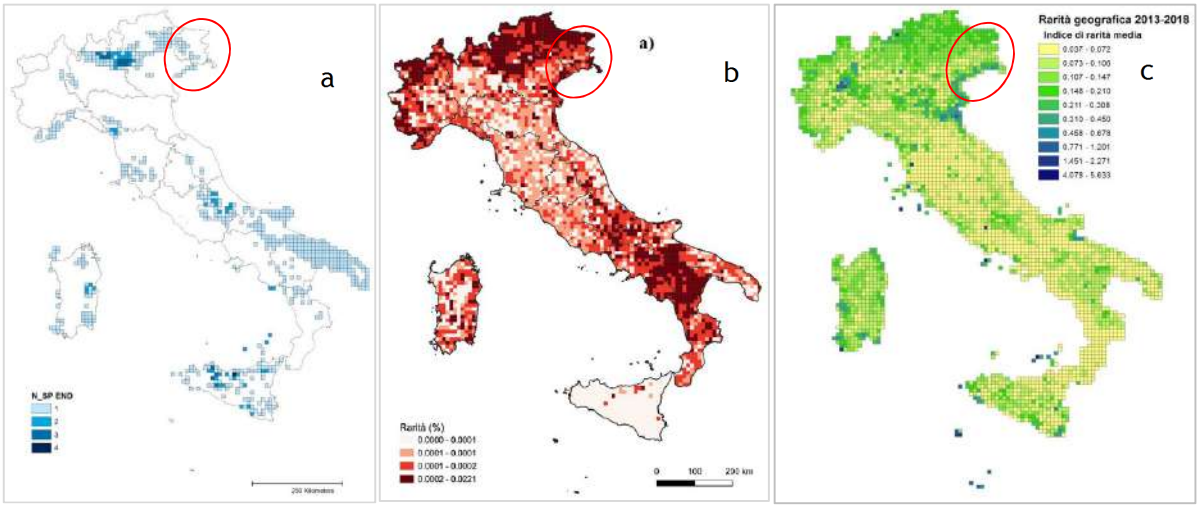


Figure 5.25: endemic plants (a), terrestrial Fauna (b), and rarity index for birds (c). Source: Ercole et. Al (2021)

Despite of this, 54% of terrestrial and freshwater flora, 54% of terrestrial and freshwater fauna and 22% of marine species of European interest in Italy are in an unfavourable (bad or inadequate) state of conservation (Ercole et. Al, 2021). To these percentage 92% of the bird species listed in Annex I must be added (Gustin *et al.*, 2016). Also, in the Programme area numerous species are in an unsatisfactory state of conservation, as shown in the following figures.

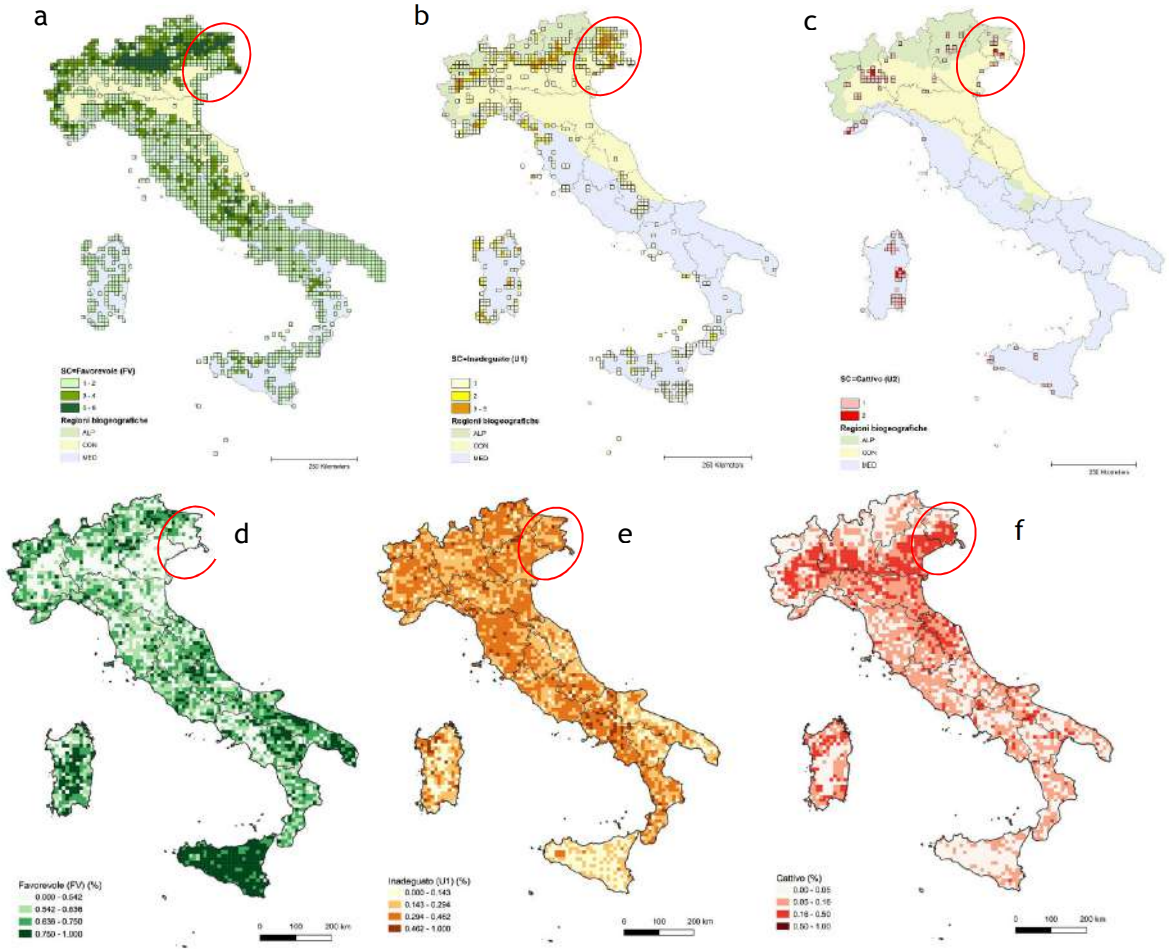


Figure 5.26: state of conservation for plant species: favorable (a), inadequate (b), bad (c), and for terrestrial animal species (not birds): favorable (d), inadequate (e), bad (f). Source: Ercole et. Al (2021).

In the bioclimatic regions involving the Programme area (Continental bioclimatic region and Alpine one), with respect to species of conservation the conditions of stability or worsening are more abundant. Therefore, the general picture is to be considered declining. According to literature, agriculture is the most relevant pressure/threat affecting both plant and animal species. Other important common pressure are infrastructure development and the presence of invasive alien species (IAS).

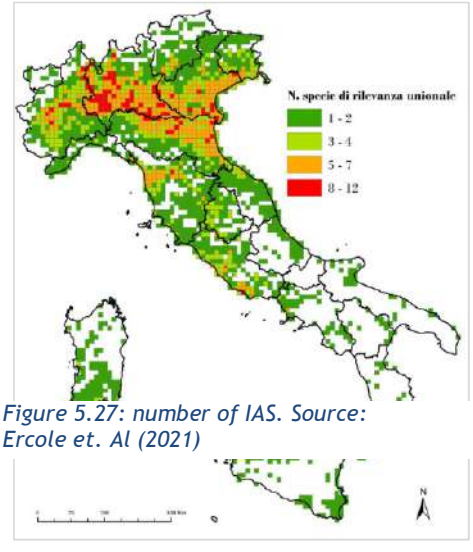


Figure 5.27: number of IAS. Source: Ercole et. Al (2021)

In Italy, 31 out of 48 IAS of European interest have been reported in 2018, a number inferior only to France and Belgium. Management measures have been implemented for 20 of them.

The concentration of species is higher in Northern Italy, in particular the Po Valley. Both Friuli-Venezia-Giulia and Veneto Regions manage 4 IAS of European interest (Fig. 5.23), the former counting 23 displays, while the latter 15.

Considering all the IAS and not only the ones of European importance, more than 3.500 species have been introduced in Italy since 1900, most of which (3.367) still present. The rate of introduction has grown exponentially over time, reaching an average of 13 species per year in the current decade (Ercole *et al.* 2021).

Current situation in Slovenia

Despite the small surface area of the country, species diversity in Slovenia is extremely high. It is estimated that there are approximately 13 000 - 5 000 animal species, as well as more than 3 200 higher plant species in Slovenia. The abundance among numerous plant and animal species is decreasing, with some species becoming endangered with the possibility of extinction. For example, more than four-fifths of all known amphibians and reptiles in Slovenia, as well as almost half of all mammals (this represents 41 species) are on the Red List of Threatened Species. Population trends of selected bird species show that the state of the environment in the cultural landscape is deteriorating, especially in some parts such as Prekmurje and Ljubljana marsh. Populations of selected forest bird species are in moderate decline, while wetland conditions have not changed in the last few years. Bird populations that overwinter on Slovenian rivers and other water bodies are stable or growing. Minor fluctuations are part of natural population changes (ARSO, 2021 [NB01]).

The conservation status of species of European interest in Slovenia indicates that only 30% of species have a favourable status. Furthermore, also the trends are unfavourable. In the years 2013-2018, the proportion of species with favourable conservation status remained stable according to the previous reporting period, while the proportion of species with poor conservation status has increased. As many as one-third of Europe's important bird species have a negative or uncertain short-term trend (ARSO, 2021 [NB11]).

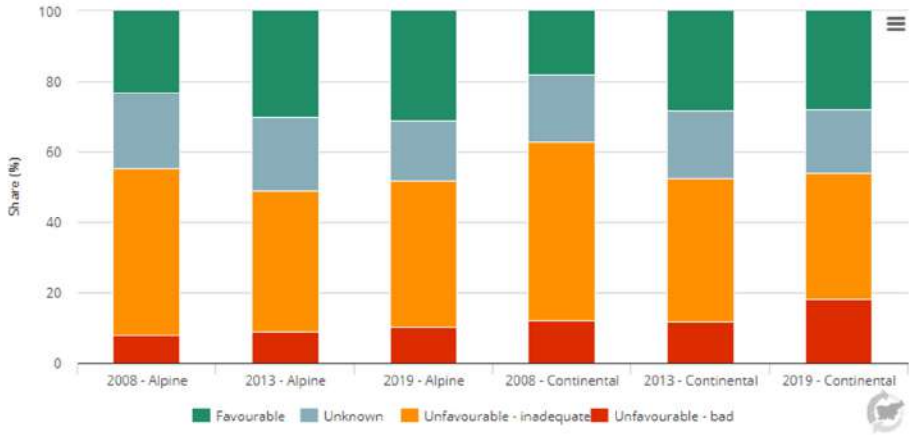


Figure 5.28: conservation status of species of European interest in Slovenia by biogeographical region. Source: ARSO, 2021 [NB11])

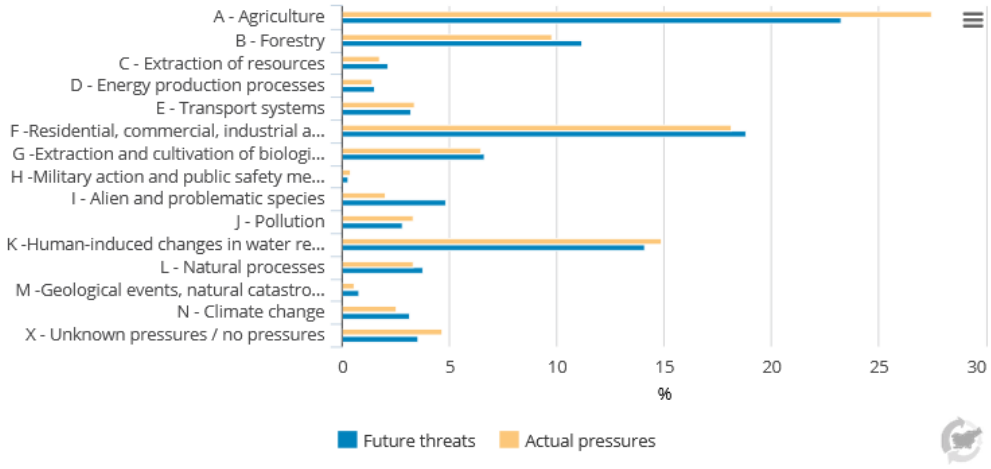


Figure 5.29: recorded pressures and threats faced by the major species in Slovenia. Source: ARSO, 2021 [NB11])

Some of the biggest actual pressures and future threats for the major species are connected with agriculture; residential, commercial, industrial and recreational infrastructure and areas as well as human-induced changes in water regimes.

5.5.2 Habitats

Current situation in Italy

Italy hosts 65% of the habitats of European interest. Many of them are concentrated in the Alpine and Pre-Alpine region, so that the Programme area is partially included in one of the country's richness spots of terrestrial habitats.

No marine habitats have been classified into an unfavourable state of conservation (bad + inadequate), but 37% are in an unknown state. Regarding terrestrial habitats, 89% are consider in unfavourable state of conservation. In the Programme area the coastal, plains and foothills habitats –in which the presence of man has the greatest impact– are in the worst conditions but also several alpine habitats are classified in an inadequate state.

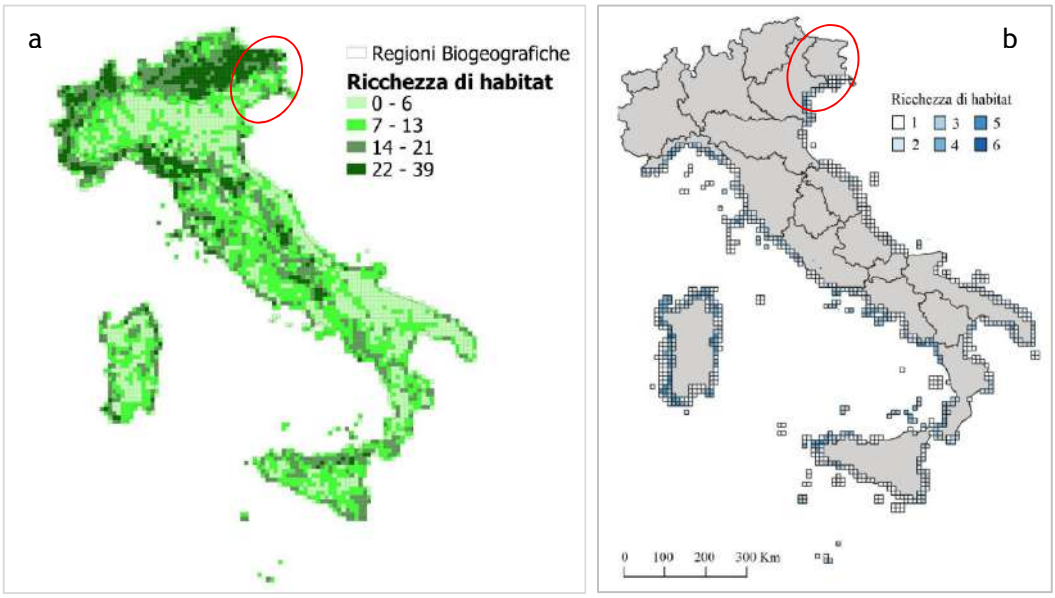


Figure 5.30: richness of terrestrial (a) and marine (b) Habitats of European interest. Source: Ercole et. Al (2021)

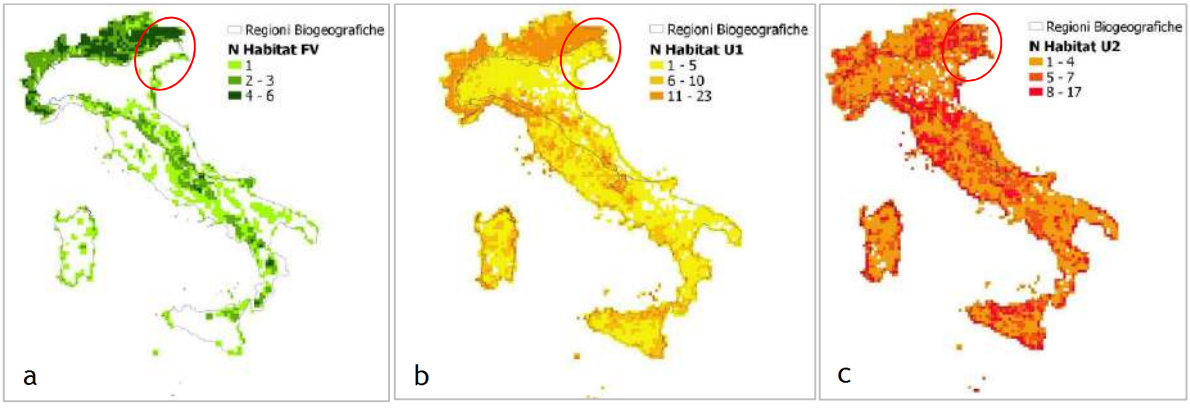


Figure 5.31: number of habitats of community interest in favorable (a), inadequate (b) and bad (c) status. Source: Ercole et. Al (2021).

Agriculture is once again the main pressure/threat affecting terrestrial habitats, followed by infrastructure development and silviculture, although the latter in the biogeographical regions of interest is overcome by other causes of degradation, such as biological invasions (continental region) or

changes in the water regime (alpine region). The comparison with the data of the previous assessment process reveals a decidedly negative trend: -14% of habitats in favourable state, +8% of habitats in inadequate state and +11,6% of habitats in bad state (Ercole *et. al.*, 2021).

Current situation in Slovenia

The favourable conservation status of habitat types in Slovenia is reached by just over a third of Europe's important habitat types in the country. It is necessary to follow the guidelines of the Regulation on Special Conservation Areas (Natura 2000 sites) more rigorously and to implement the Natura 2000 management program. This is especially important for areas with freshwater, wetland, wetland and grassland habitat types (ARSO, 2021 [NB12]).

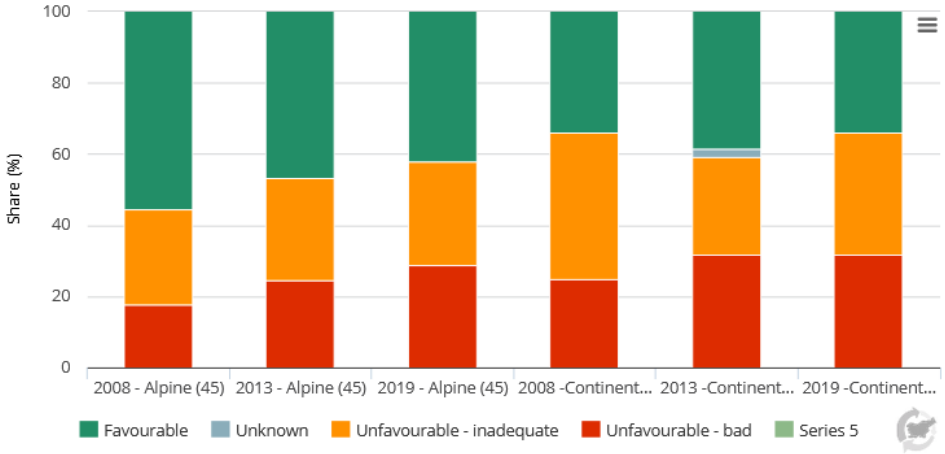


Figure 5.32: conservation status of habitats by biogeographical region, 2008, 2013 and 2019. Source: ARSO, 2021 [NB12]).

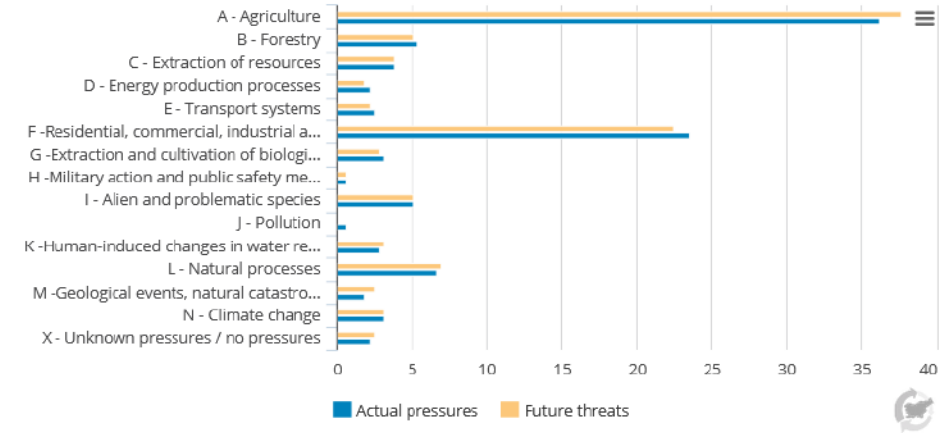


Figure 5.33: recorded pressures and threats to habitat types of European interest in Slovenia, 2019. Source: ARSO, 2021 [NB12].

Some of the biggest actual pressures and future threats to habitat types of European interest in Slovenia are connected with agriculture and residential, commercial, industrial and recreational infrastructure and areas.

5.5.3 Geodiversity

Current situation in Italy

About 2.700 geosites have been currently recognized in Italy, about thirty of which are considered of international interest. To these are added 10 Global Stratotype Section and Point (GSSP), representing the global reference standard for the definition of a specific chronostratigraphic limit (National inventory of geosites - Department for the Geological Service of Italy).

Although geosites are an expression of the geodiversity of a territory, their unbalanced distribution in the country is due to a different local progress of the geosite census, more than to a greater or lesser geodiversity among Italian regions (Giovagnoli, 2018). Nonetheless, the Programme area is outstanding for its high geodiversity value. This is true with respect to Friuli Venezia Giulia, one of the richest Italian regions for geosites endowment (234) and counting 22 geosites of international interest, while in the Province of Venice are placed just 3 out of the 50 geosites mapped by the Veneto Region.

The geodiversity of Italy has been recognized and protected/promoted also through the establishment of geoparks. The status of these areas is not yet recognized by specific national legislation. The initiative can therefore be supported by local laws (like the one of Friuli Venezia Giulia), or by the Global Network of UNESCO Geoparks; 12 Italian geoparks belong to the latter, making Italy second only to Spain (15) in Europe. No geopark falls within the Programme area, although two projects are underway to establish the regional and cross-border geopark of the Classical Karst (ITA-SLO), and the regional geopark of the Carnic Alps, both to be possibly nominated as UNESCO geoparks in the near future.

Current situation in Slovenia

A significant geodiversity within Slovenia is what among other factors provides for the significant landscape and biological diversity within a relatively small territory. Due to prevailing carbonate bedrock (42%), as well as the suitable climate, karst phenomena are especially well developed in Slovenia (Erhatrič, 2010).

Within the programme area, there are 409 geologic and geomorphologic natural values, as well as two geoparks that both have a status of UNESCO Global Geopark; the Geopark Karst and the Geopark Idrija. They represent exceptional geologic and geomorphologic inheritance, however, there are no additional limitations imposed within their area. Currently, the cross-border geopark of the Classical Karst is being developed (ITA-SLO) (NPS, 2017; ARSO, 2021a).

5.5.4 Protection and management of natural heritage

Current situation in Italy

In Italy about 10,5% of the terrestrial area and 8,5% of the coastline are protected by national law (23 National Parks, 134 Regional Parks, 147 State Natural Reserves, 365 Regional Reserves, 171 other Regional Protected Areas, 27 marine protected areas, 2 submerged parks and the Marine Mammal Sanctuary) for a total of over 3 million hectares protected on land and approximately 2,8 million hectares of sea and 658 kilometres of coastline. In the last decade, the surface covered by protected marine areas has slightly increased (+1.9%) while the land areas have remained almost stable (+ 0.03%). Adding the natural areas protected by international agreements (2.000 SCIs-SACs, 279 SPAs, 357 SCIs-SACs/SPAs, 57 Ramsar areas), about 22% of the national territory is under some tool of protection. Natura 2000 sites have remained almost stable in the last decade.

In the Programme area a considerable share of protected areas is present: 2 Regional Parks, one Regional Reserve, 30 Natura 2000 sites and one Ramsar area in Province of Venice, where about 24% of the territory is protected; 2 Regional Parks, 13 Regional Reserves, 37 Biotopes[8], 66 Natura 2000 sites and 2 Ramsar areas in Friuli Venezia Giulia, where about 25% of the territory is protected. This percentages, slightly over the national average, are largely due to the extension of Natura 2000 network, since natural parks and reserves are under-represented compared to the Italian average

[8] Areas outside Parks and Reserves of limited territorial extension, characterized by relevant naturalistic emergencies under risk of disappearance (RL 42/96).

(6,8% in Friuli-Venezia-Giulia, largely overlapping the Natura 2000 sites) and only 0,12% in the province of Venice.

Figure 5.34: national and international protected areas in the Italian part of the Programme area. Archidata processing on regional data.

Current situation in Slovenia

Large-scale protected areas are national, regional and landscape parks while the small-scale protected areas are strict nature reserves and natural monuments. Together they cover 12% of the programme area. Within the programme area in Slovenia, there are 21 landscape parks, 25 nature reserves, 201 natural monuments, 1 national park, 2 regional parks, and 40 monuments of altered nature, together covering an area of 1720 km2. In recent years, the total surface area of protected areas has expanded, largely due to the designation of five larger parks (ARSO, 2021a).

There are 2671 natural values within the programme area, out of these 1538 are areas, covering 11.4% of the programme area. Many Natura 2000 areas are present – 168 Special Areas of Conservation (SAC areas) and 19 Special Protection Areas (SPA areas), covering 4189 km2 that represents approximately one-third of the programme area. Ecologically important areas are defined on nearly half of the programme area (ARSO, 2021a).

Type of area protection	Number of units	Area (in km^2)*	% of the programme area in Slovenia
Protected areas (large and small scale)	290	1720	12.2%
Natural values (areas)	1538	1616	11.4%
Natural values (locations)	1133	/	/
Natura 2000 area	187 (168 SAC and 19 SPA areas)	4189	29.6%
Ecologically important areas	169	5817	41.2%

Table 5.6: number and covered land (in ha) of nature conservation protection regimes in Slovenia. Source: ARSO, 2021a.

Assessment of the development according to the zero alternative

Environmental	Indicators	Last available data and description of trend	ZA

aspect			
Biodiversity	Favourable condition for species of European interest	IT (2018): In Italy 54% of terrestrial and freshwater flora, 54% of terrestrial and freshwater fauna and 22% of marine species of community interest are in an unfavourable state of conservation (bad + inadequate). 3.367 alien species still present in Italy, 54 IAS (23 in Friuli Venezia Giulia, 15 in Veneto). The rate of introduction of alien species is increasing. IT (2018): No marine habitats classified in unfavourable state of conservation (bad + inadequate), but 37% in an unknown state, 89% terrestrial habitats in unfavourable state of conservation. The trend is negative (-14% of habitats in favourable state, +8% of habitats in inadequate state and +11,6% of habitats in bad state)	↘
		SL:as many as 1/3 of Europe's important bird species have a negative or uncertain short-term trend.	↘
Geodiversity	Protection and promotion of the geological heritage	IT (2019): the Programme area, in particular FVG, standing out for high geodiversity value. None of the 12 Italian geoparks falls within the Programme area, although two projects are underway to establish the regional and cross-border geopark (ITA-SLO) of the Classical Karst, and the regional geopark of the Carnic Alps; both could be proposed as UNESCO geoparks in the future. Friuli Venezia Giulia has also established a regional network to promote and protect local geodiversity which currently covers 28% of the regional territory.	↗
Protection and management of Protected areas	Development of nature protection areas	IT* (2021): About 25% of the territory is protected, by the presence of 4 Regional Parks, 14 Regional Reserve, 96 Natura 2000 sites, 37 Biotopes and 3 Ramsar area. The percentage is close to the national average, largely due to the Natura 2000 network; Parks and Reserves are underrepresented. The extension of protected areas has remained roughly stable in recent years.	↔
		SI (ARSO, 2021): Protected areas cover 12% of the programme area in Slovenia. In recent years, the total surface area of protected areas has expanded, largely due to the designation of five larger parks. Natura 2000 covers a little less than 1/3 of the area as 168 Special Areas of Conservation (SAC areas) and 19 Special Protection Areas (SPA areas) are defined, 2671 natural values are present and ecologically important areas cover 41% of the programme area in Slovenia	↗
↑ Improving trend; ↗ Partially or gradually improving trend; ↔ Unchanged trend; ↘ Partially or gradually deteriorating trend; ↓ Deteriorating trend			

5.6 Landscape and Cultural heritage

In 2000 the Council of Europe adopted the European Landscape Convention as a specific, comprehensive reference text devoted entirely to the conservation, management and improvement of European landscapes in the international legal instruments on the environment, regional planning and the cultural heritage.

Agricultural policy has been particularly influential in shaping current European landscapes. Europe is experiencing a decline in biodiversity primarily due to the loss, fragmentation and degradation of natural and semi-natural ecosystems and agricultural intensification is one of the main causes, since efforts to increase production efficiency and income resulted in increasing land parcel sizes and a reduction in landscape features. The post-2020 Communitarian Agricultural Policy (CAP), among other purposes, is aimed to take care of a set of environmental objectives, such as climate change action and landscapes and biodiversity preservation.

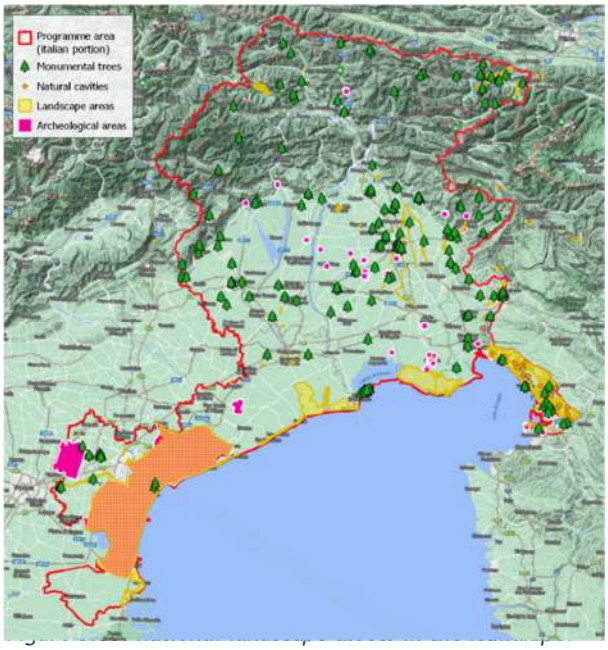
Nonetheless, landscape fragmentation continues to increase, especially in some rural and less populated areas, although the increase was lower in and around Natura 2000 sites than in unprotected areas (EEA, 2019).

Cultural heritage is an important resource for economic growth, employment and social cohesion. It helps revitalise urban and rural areas and promote sustainable tourism. In the European Union, over 300,000 people are employed in the cultural heritage sector and 7.8 million jobs are indirectly linked to heritage (e.g. hospitality, interpretation and security). While policymaking in this area is primarily the responsibility of Member States, regional and local authorities, the EU is committed to safeguarding and enhancing Europe's cultural heritage.

5.6.1 Landscape

Current situation in Italy

Italy recognizes many areas, part of the broader group of cultural heritage, defined as "real estate or geographical areas which are recognized as an expression of the historical, cultural, natural, morphological and aesthetic values of the territory" (Code 42/2004[9]). The main archaeological sites and monumental trees are also part of the landscape assets.



tion of the Programme area. Archidata processing on regional data

In the Programme area there are 226 monumental trees (particularly concentrated in Friuli Venezia Giulia Region), 75 natural caves (all in karst areas), 71 restricted archaeological areas (3 in the province of Venice, but covering 30% of the territory) and more than 1.000 hectares of restricted landscape areas, particularly related to karst or lagoon/coastal areas, that covers 30% of the territory of the province of Venice and 31% of the territory of Friuli Venezia Giulia.

Some UNESCO sites fall in the category of landscape assets. Italy shares with China the primacy for the number of places labelled as world heritage sites (up to 58), in addition to a relevant number of UNESCO Man and Biosphere (MAB) Reserves (20).

Some of this kind of sites are in the Programme area and they can be considered landscape assets: World Heritage Site “Venice and its lagoon” (wider than 700 Km^2), including the architectural heritage of the city, is the largest example of semi-lacustrine habitat in the Mediterranean; a consistent portion, of the World Heritage Site of “Dolomites”, namely the Brenta Dolomites (464 Km^2), a series of unique mountain landscapes and an exceptional natural beauty; “Palù di Livenza”, one of the 111 sites of the World Heritage Series named “Prehistoric Pile Dwellings”, consisting in a settlement populated since Palaeolithic (4900 BC). Finally, the large cross-border MAB Reserve of "Julian Alps", that constitutes a hinge between landscapes, ecosystems and different cultures as well as a meeting place between the Latin and Slavic world.

Landscape protection, in general, requires a holistic approach that ensures on the one hand the protection of morphological and biological diversity, and on the other the conservation of traditional anthropogenic activities. Demographic trends could hinder these requirements: the mountain portion of Friuli Venezia Giulia is in a decreasing trend and has decreased by about 8-10% compared to 2011. On the coasts, on the other hand, the population has remained stable and anthropogenic pressure from settlements, infrastructures, and agricultural activity impact.

Agriculture is potentially one of the main practices that can enhance landscape management and preservation of its diversity due to the maintenance of meadows and pastures, but is even one of the recognized factors for landscape fragmentation (EAA, 2019). A simulation for the period 2015-2030 of agricultural land abandonment in Europe estimated a medium-high loss for Italy in both absolute and relative terms (more than 450.000 hectares, 3,4% of total UAA). However, the expected loss in the Programme area is very limited; moreover, for the Italian context, the loss of arable land is mainly expected (about 80 of the hectares for which the abandonment is foreseen) and only a minor portion of the territory should concern permanent crops and pastures. (European Commission, 2018)

Fragmentation, on the other hand, is related to population density, with coastal and lowland areas being the most impacted, especially the Po Valley. According to ISPRA, Veneto and Friuli Venezia

[9] The Code incorporates the concepts of Landscape as identified in the European Landscape Convention.

Giulia are respectively the first and the third Italian regions for landscape fragmentation, with a percentage of strongly fragmented territory of 29,8% and 25,5% respectively (ISPRA, 2021)[10].

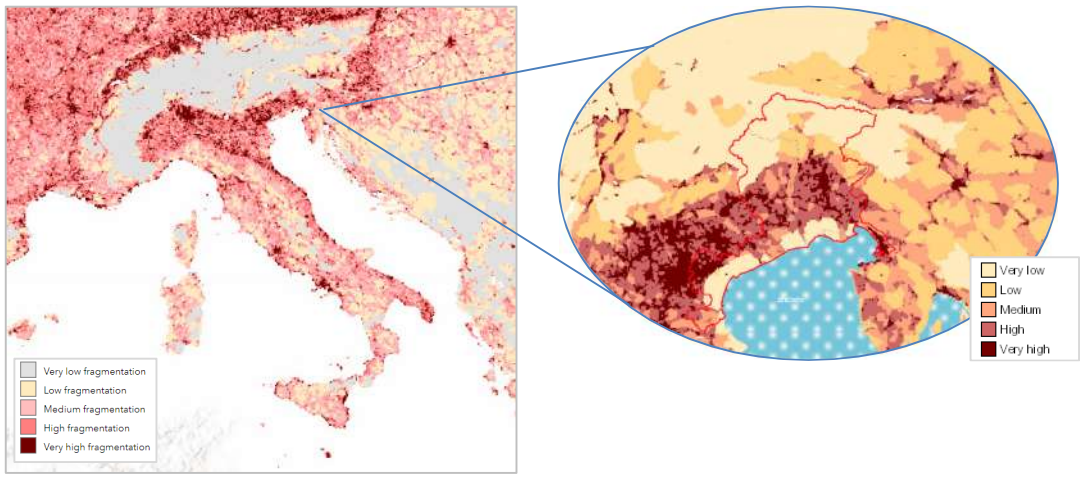


Figure 5,36: mesh density in Italy and in the Programme area. Source: EEA, 2020c

Current situation in Slovenia

The protection of landscape in Slovenia is not defined in a way that it would have special protection regime that would enable its management and preservation of landscape diversity. Moreover, the "landscape policy" is not shaped in Slovenia.

However, the need for landscape protection, management and preservation of its diversity is mentioned in several strategic documents on the national as well as local level, but it is rather neglected in the implementation phase. For example, the Spatial Development Strategy does define outstanding landscapes. However, management and preservation measures are poorly defined and incorporated in the following steps of spatial development.

The problem is that landscape does not have an environmental authority that would carry out control and prevent negative impacts on the landscape. Although management of landscape is directly or indirectly addressed within the development or protection of different sectors (agriculture, forestry, water management, tourism) since the landscape and its diversity plays an important part in each of them, the holistic view is not always provided. Neglecting the importance of a holistic approach and lack of cross-sectoral coordination is often reflected in negative impacts on landscape and its diversity.

The landscape is, however, partially covered through protection regimes of nature protection and protection of cultural heritage. Management measures in some of these areas also have an impact on the state of the landscape, mostly as a consequence of the promotion of traditional land use and biodiversity protection measures. Large scale protected areas are national, regional and landscape parks while the small scale protected areas are strict nature reserves, nature reserve and natural monuments. The most important in this view, mainly due to their size and impact of the management measures on the landscape diversity, is the large scale protected areas. Within the programme area in Slovenia, there are 21 landscape parks, 25 nature reserves, 201 natural monuments, 1 national park, 2 regional parks, and 40 monuments of altered nature, together covering an area of 1720 km^2. In recent years, the total surface area of protected areas has expanded, largely due to the designation of five larger parks (ARSO, 2021a). Moreover, nature values and Natura 2000 areas and management measures within them also contribute to the good status of landscapes.

Besides the areas protected due to the natural values (see Section 5.5.4), a special regime for landscape protection is defined for cultural landscapes protected by the Law on Cultural Heritage

[10] Landscape fragmentation is calculated referring to the method of Effective Mesh Density (SEFF), i.e. the degree to which movement between different parts of the landscape is interrupted by a Fragmentation Geometry (FG). FGs are defined as the presence of impervious surfaces and traffic infrastructure. The SEFF gives the effective number of meshes (or landscape patches) per 1000 km^2: the more FGs fragment the landscape, the higher the effective mesh density.

that also protects the areas being of extreme importance due to the traditional land use. This mechanism enables the prevention of negative impacts due to new spatial interventions but does not provide measures or funding mechanisms that would contribute to the management of the landscape.

Since on some areas the protection regimes listed in the previous Table 5.5 (e.g., Triglav National Park is a protected area, many natural values and Natura 2000 areas are present within it as well as cultural landscape), the dissolved area of protection regimes that to some extent contribute to the good status of landscape represents a smaller share of the programme area in Slovenia than the sum of the values from the table above. The figure below represents all these areas. Within the rest of the programme area (red hatch), the good status of a landscape is addressed through spatial planning that often does not provide a holistic approach toward the good status of the landscape and its diversity.

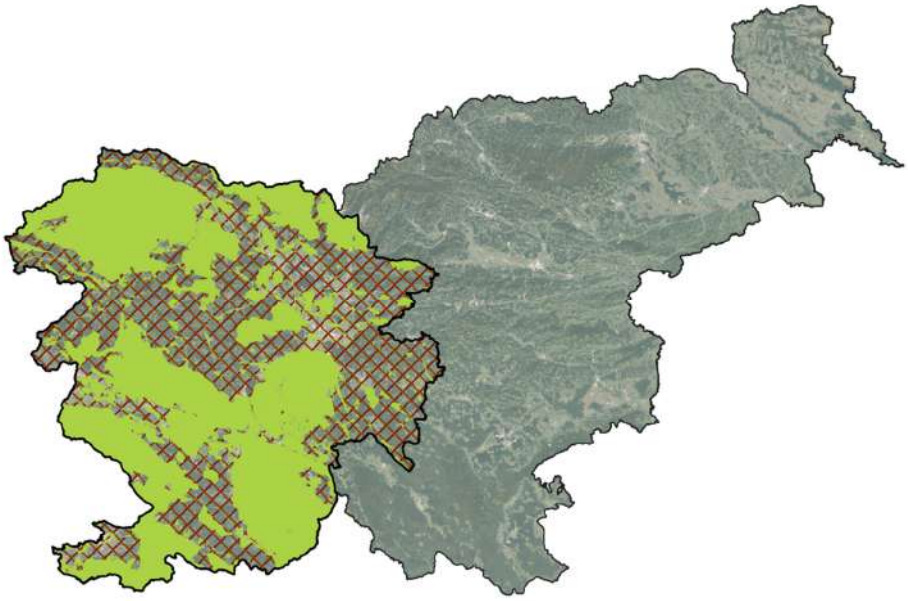


Figure 5.379: areas of nature and cultural heritage protection that contribute to the good status of landscape (coloured green). Source: ARSO, 2021a; eVRD, 2021

Besides the types of area protection regimes listed above, the protective forests and forest reserves also have an impact on the state of the landscape due to special management measures defined within them.

Type of area protection	Area (in km^2)	% of the programme area in Slovenia
Protective forests	989	7.0%
Forest reserves	94	0.7%

Table 5.7: covered land (in ha) of protective forests and forest reserves within the programme area in Slovenia. Source: SFS, 2018

Agriculture could be defined as one of the main measures for landscape management and preservation of its diversity. Unfortunately, simulation (for the period 2015-2030) of agricultural land abandonment in Europe shows that agricultural land is under high potential risk of abandonment due to factors, related to biophysical land suitability, farm structure and agricultural viability, population and regional specifics. Competition for land with other land uses could also be identified as one of the drivers for agricultural land abandonment (European Commission, 2018).

Landscape Fragmentation measures landscape fragmentation due to fragmentation geometry (transport infrastructure and sealed areas) and provides an insight into the functioning of landscape, strongly connected to ecological connectivity (JRC, 2014).

	2009	2012	2015
Average number of meshes per km^2	1.57	1.6	1.61
Area of strongly fragmented landscape (% of the country area)	42.92	42.61	42.63

Table 5.8: landscape fragmentation status and trends in Slovenia. Source: EEA, 2020

In 2015, on average, there were around 1.5 fragmented landscape elements per km^2 in the European Union. Fragmentation represents slightly bigger pressure in Slovenia: 1.61.

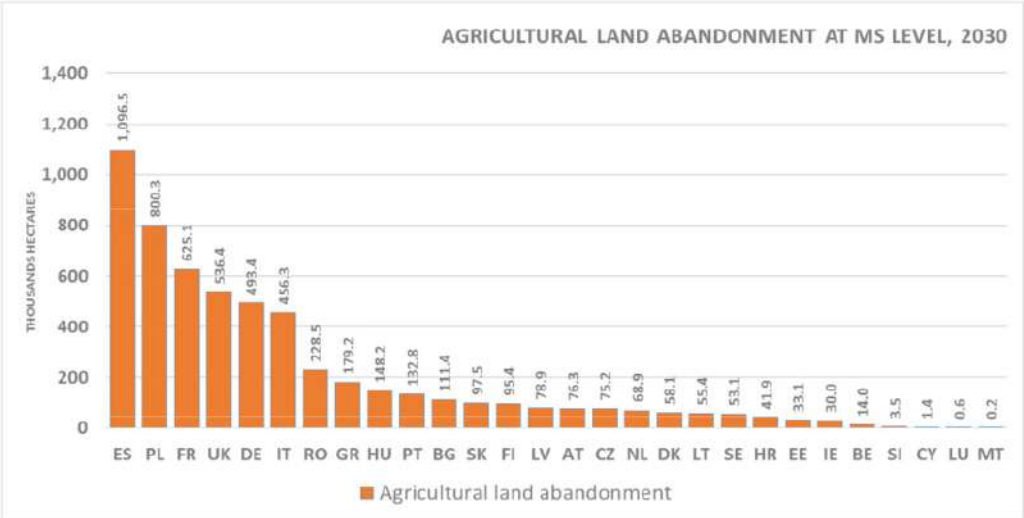


Figure 5.38: absolute agricultural land abandonment between 2015 and 2030 by EU Member States. Source: Perpiña et al, 2018

The figure above presents the absolute agricultural land abandonment between 2015 and 2030. Based on these predictions agricultural land abandonment on 3,500 ha. in Slovenia might result in negative impacts on the landscape and its diversity as well.

5.6.2 Cultural heritage

Current situation in Italy

As anticipated and well known, Italy is one of the countries with the richest cultural endowment in the world, and with the highest concentration of UNESCO World Heritage sites. Among those not yet mentioned, the Programme area includes: (i) the component “fortress city of Palmanova” of the UNESCO site named “Venetian Works of Defence between the 16th and 17th Centuries”, an important example of military architecture in the modern age; (ii) the “Archaeological Area and the Patriarchal Basilica of Aquileia”, which preserves evidence of one of the largest and wealthiest cities of the Early Roman Empire; (iii) the “Gastaldaga’s area” of the UNESCO site dedicated to the epic of Lombards rule in Italy (568-774 A.D.)”.

In Italy are located 14 of the 584 UNESCO intangible cultural assets, 6 included in the Programme area: 5 elements concerning knowledge and practices shared with the whole country (and other countries), namely "Mediterranean diet", "Falconry", "The art of dry-stone walls", "Alpinism" and "Transhumance", while the 6th is idiosyncratic of the Venice Lagoon, namely, "The art of glass pearls" tradition of Venice and the islands (Murano, Burano, Torcello and Pellestrina).

In addition to UNESCO sites, the Italian law provides to identify and protect all those elements having the value of testimony of civilization, for that representative of artistic, historical, ethno-anthropological, archival and bibliographic interest (Code 42/2004). The following table shows the number of

cultural assets included in the regional catalogues. The method of data collection does not allow a comparison between provinces of different Regions, but it must be taken into account that the Province of Venice hosts 74% of the assets included in the regional catalogue of the Veneto, demonstrating the historical-cultural importance of this territory.

	Province of Venice	Province of Udine	Province of Pordenone	Province of Gorizia	Province of Trieste
Architecture	1.295	5.053	2.222	577	788
Artwork	674	11.133	3.477	2.294	3.163
Archaeological finds	4.173	14.777	3.104	2.513	3.895
Museums/Collections	ND	93	34	23	30
Ethno-anthropological material assets	ND	11.227	2.780	728	687
Parks and Gardens	ND	150	36	32	26

Table 5.9: categories of cultural assets in the Programme area. Source: regional catalogues

Current situation in Slovenia

The programme area is rich with tangible and intangible (living) cultural heritage. In total 16461 units of tangible cultural heritage are present in the Slovenian part of the programme area. Out of these 3231 are protected as cultural monuments (eVRD, 2021). More detailed data on the number of units per type of cultural heritage is presented in the table below.

	Arch. heritage	Cultural landscape	Hist. landscape	Secular heritage	Sacral heritage	Sacral/ secular heritage	Settlement heritage	Parks and gardens	Memorial heritage	Other	Total
Units	1.783	162	26	6.218	3.994	118	993	146	2.987	34	**16.461**
Other cultural monuments	326	13	9	1.352	714	45	83	58	626	5	**3231**

Table 5.10: units of cultural heritage by type within programme area in Slovenia. Source: eVRD, 2021

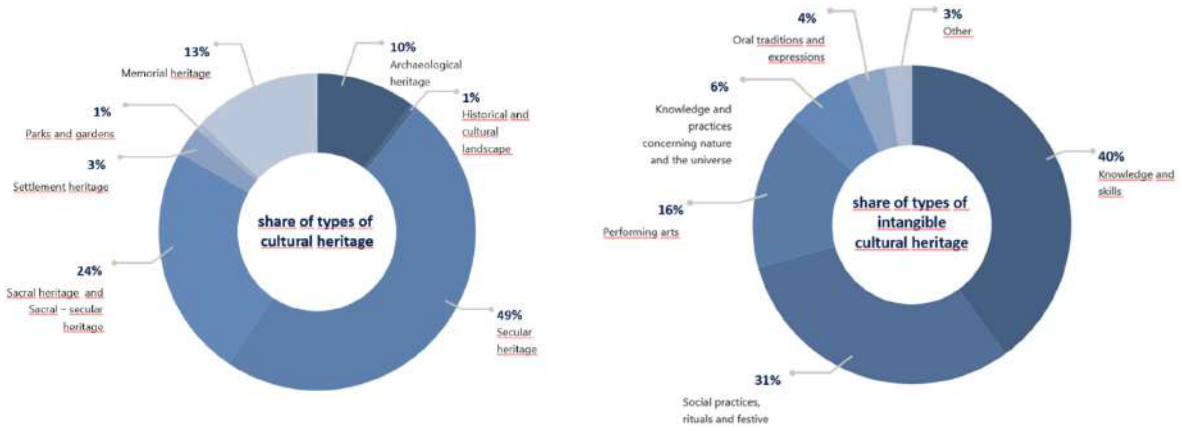


Figure 5.3910: types of tangible (a) and intangible (b) cultural heritage in Slovenia, Source: eVRD, 2021, 2021

Buildings represent the majority of units of cultural heritage, followed by a memorial and archaeological heritage. Despite a small share of units of cultural landscapes (less than 1% of all cultural heritage units), they cover 59% of the area protected as cultural heritage (around 126 440 ha). In total, areas under cultural heritage protection cover 14% of the programme area in Slovenia (eVRD, 2021).

The Register of the Intangible Cultural Heritage is a technical list of intangible cultural heritage. It includes elements connected with intangible cultural heritage and the bearers of that heritage. Proposals for inclusion in the Register are drawn up by the Coordinator for the Safeguarding of the Intangible Cultural Heritage, while the Register is maintained by the Ministry of Culture of the Republic of Slovenia. Considering the Register of the Intangible Cultural Heritage, 62 units of

intangible heritage are present within the Slovenian part of the programme area. Nearly half of them are represented within the type of knowledge and skills. For these, 141 bearers of the heritage are inscribed in the register (Register, 2021).

Apart from the units of the cultural heritage of national and local importance presented above, there are elements protected as UNESCO elements of cultural heritage; four sites protected as World Cultural Heritage: Škocjan Caves, The works of Jože Plečnik in Ljubljana – Human Centred Urban Design, Prehistoric Pile Dwelling around the Alps, and Heritage of Mercury – Idrija (UNESCO, 2021); and four being on the Representative List of the Intangible Cultural Heritage of Humanity: Art of dry stone walling, knowledge and techniques; Bobbin lacemaking in Slovenia; Door-to-door rounds of Kurenti and Škofja Loka passion play (UNESCO a, 2021).

Assessment of the development according to the zero alternative

Environmental aspect	Indicators	Last available data and description of trend	ZA
Landscape	Extension of protected landscapes	IT* (2021): About 30% of the territory protected (particularly related to karst or lagoon/coastal areas) + 4 UNESCO sites of landscape-environmental value, including MAB Julian Alps.	↗
		SI (ARSO, 2021): No special protection regime, but partially covered through regimes for nature protection and protection of cultural heritage. In recent years, the total surface area of protected areas has expanded, largely due to the designation of five larger parks.	↗
	Risk of agricultural land abandonment	IT (2018): A medium-high loss expected for Italy in both absolute and relative terms. However, a very limited expected loss in the Programme area	←→
		SI (2018): Based on predictions agricultural land abandonment on 3,500 ha in Slovenia might result in negative impacts on the landscape and its diversity	↘
	Landscape fragmentation	IT* (2019): Veneto and Friuli Venezia Giulia are respectively the first and the third Italian regions for landscape fragmentation, with a percentage of strongly fragmented territory of 29,82 and 25,45. The growth of artificial surfaces will widen the problem in next years	↘
		SI (2015): Slight increase in the number of meshes per km2 (1.57 → 2009; 1.6 → 2012; 1.61 → 2015). No significant trend in strongly fragmented landscape (1.6 fragmented landscape elements per km^2)	↘
Cultural heritage	Registered cultural heritage	IT* (2021): The Province of Venice includes 74% of the assets in the Veneto regional catalogue. Three UNESCO World Heritage sites, one recently added (2017)	↗
		SI (2021): 16.461 units of cultural heritage registered + 3.231 protected as a cultural monument. Four elements inscribed in the UNESCO world heritage list. Insufficient financial means, unresolved issues of ownership and low level of awareness reflect in lack of maintenance and care	↘
	Intangible cultural heritage	IT* (2021): 6 of the 14 UNESCO intangible cultural assets are included in the area	↗
		SI (2021): At the national level 62 units and 141 bearers listed in the register of intangible cultural heritage. Four elements inscribed in UNESCO intangible cultural heritage list. Globalization processes lead to the abandonment of traditional crafts, traditions and skills	↘

↑ Improving trend; ↗ Partially or gradually improving trend; ←→ Unchanged trend; ↘ Partially or gradually deteriorating trend; ↓ Deteriorating trend

5.7 Population and human health

Public health can be presented through a several number of indicators. Some of the most general are life expectancy at birth and healthy life years at birth. Life expectancy at birth reached 81 years across the 28 EU member states in 2016. Life expectancy at birth now exceeds 80 years in two-thirds of EU countries. In case of Italy and Slovenia – both countries perform beter than EU average. The main causes of death in EU countries are circulatory diseases and various types of cancer, followed by respiratory diseases and external causes of death.

Hazards in the environment are a major determinant of health. Air pollution as the single largest

environmental health risk, followed by noise as the second most important environmental health issue (see Chapter 5.1). Road traffic is the most widespread source of environmental noise, with more than 70 million people affected by harmful levels in the EU member countries. Noise from railways, air traffic and industry are also important sources of noise (EEA, 2019c).

Two other important environmental issues affecting health in Europe and worldwide are related to chemical pollution and climate change. The adverse effects of climate change on health are growing. The effects of climate change on health include direct impacts, such as temperature-related illness and death, and the impacts of extreme weather events. They also include more indirect impacts as those that cause water- and food-borne diseases; vector-borne diseases; or food and water shortages.

According to EEA (EEA, 2012) 150 000 deaths worldwide were caused by climate change in 2000. Different types of extreme weather events affect different regions. Heatwaves are mostly a problem in southern Europe and the Mediterranean, but they are also a problem in other regions. Other extreme weather events — such as high precipitation events that might cause floods — also affect public health. Higher temperatures facilitate forest fires. Around 70 000 forest fires occur every year on the European continent.

5.7.1 Exposure to air pollution

Current situation in Italy

In previous Section 5.1.1 the levels of exceedance for different kinds of pollutants in the air have been remarked.

Friuli Venezia Giulia's data register 490 km^2 and about 135.000 people (11% of the resident population) subjected to exceedance of the PM_{10} thresholds in 2019, showing an increase with respect to 2015 in the surface, but a decrease in resident population interested by the issue (correspondingly 412 km^2 and 154.000 people)[11]. For the Province of Venice no available data were found, but considering the municipalities with exceedances, in 2019 approximately 730.000 (86% of the resident population) people can be considered affected (personal estimation on data ISTAT, 2020).

Relating to O_3, the area affected by exceedance in Friuli Venezia Giulia is 7.536 km^2, hosting about 921.000 inhabitants (76% of the whole resident population) in 2019. Again, the dynamics concerning the previous 4 years show an improvement with respect to population affected (944.828 units) and a worsening for land covering (6.361 km^2)[12]. The lack of official data on the Province of Venice forces to consider the same approximation run for PM_{10}, estimating approximately 715.000 (84% of the resident population) people affected by exceedance in 2019 (personal estimation on data ISTAT, 2020).

Overall, about 1,5 million people in the Italian programme area are subject to ozone pollution, and about 900.000 are also subjected to fine particulate pollution. In the areas most affected by pollution the resident population has remained almost stable over the last decade (ISTAT, 2020).

Current situation in Slovenia

As mentioned, (see Section 5.1.1) PM_{10} emissions in 2020 have been lower than in previous years, with a number of exceedances of the daily limit value over the threshold in just one monitoring site in mainland Slovenia. Nonetheless, children's exposure to PM_{10} concentrations higher than recommended by the WHO (ARSO, 2021 [ZR08]).

Since 2006 concentrations of SO_2 in ambient air are no longer harmful to human health. Furthermore, the critical annual value of SO_2 (20 µg/m^3) for the protection of vegetation is no longer exceeded (ARSO, 2021 [ZR05]). Concentrations of NO_2 and total NO_x in ambient air do not exceed the prescribed limit values for safeguarding human health (ARSO, 2021 [ZR07, ZR10]).

Data shows that in 2018 and 2019 there were no infant deaths due to respiratory diseases. Surveys showed an existing but complicated link between air pollution and infant mortality due to various

[11] http://cmsarpa.regione.fvg.it/cms/tema/aria/stato/Gas_serra/index.html#gas_serra_4, accessed 18th October 2021.
[12] *Ibidem*.

externalities (allergens, cigarette smoke, lifestyle, etc.) (ARSO, 2021 [ZD01]). In 2019, 4,8% inhabitants were diagnosed with asthma, which is below EU average. Evidence supports a relationship between exposure to air pollution (mostly due to PM10) and exacerbation of asthma (ARSO, 2021 [ZD02]). All children are exposed to PM_{10} levels lower than the EU limit value, however, they are exposed to higher concentrations as recommended by the World Health Organization (ARSO, 2021 [ZD03]). In the period 2002-2020, the highest exposure to ozone was detected in Primorska region in summer, which is in a large part due to the transboundary pollution. Ozone concentrations in ambient air in Slovenia are among highest in EU (ARSO, 2021 [ZD029]). Mortality due to respiratory diseases is decreasing; in the period 2000 to 2019 it decreased from 74/100.000 inhabitants to 52/100.000 inhabitants (ARSO, 2021 [ZD018]).

5.7.2 Exposure to noise

Current situation in Italy

Noise seems to be a little addressed environmental issue in Italy. As a matter of fact, data communicated by Italy to feed the last European Environment noise report (EEA, 2020), are estimated to be only 10,6% of the whole real complete picture[13].

According to the aforementioned report, the percentage of the Italian population exposed to significant noise levels (>55 dB) is 25,7%. This value coincides to the proportion of inhabitants subjected to noise pollution from the road source alone (13,7% inside urban areas + 12% outside urban areas), which is the source that most afflicts the country. They could be added 4,2% of the population subjected to noise pollution from rails (especially outside urban areas), 1% from air sources (mostly internal to urban areas) and 0,1% from industrial sources (EEA, 2020).

The report predicts an increase in noise pollution for the whole Europe by 2030, due to an increase in the population subjected to noise pollution from road and rail sources (+8-15%) not balanced by the slight reduction from airborne and industrial noise (EEA, 2020).

The most recent data from the National Institute of Statistics (ISTAT) cover the period 2008-2012. For these years, ISTAT provides the percentage data of the noise monitoring campaigns registering noise exceeding limits, and Italy has shown an oscillating but growing trend. The provinces inside the Programme area had great variability (also due to the poor number of campaigns carried out): in the province of Venice, the registered data on noise exceeding limits go from 17,7% in 2008 to 91% in 2021; in the province of Udine, the data increased from 33% to 100%; in the province of Gorizia, from 16,7% to 100%; in province of Trieste from 0 to 75%; finally, in Pordenone the value is 100% for both years[14].

In Italy, Law 447/95 requires municipalities to adopt acoustic zoning, that divide their territory into homogeneous areas, according to their intended use. It is a planning tool for urban development and for the protection of the territory from noise pollution.

With respect to the Programme area, more than 80% of the municipalities have adopted the Plan, while[15] several municipalities are still undergoing the process to approve their acoustic plan.

Current situation in Slovenia

The number of inhabitants who live in the impact area of major roads outside urban areas has decreased. In 2017, around 16 000 fewer inhabitants (around 34 000 altogether) were exposed to high noise levels throughout the day and during the night compared to 2012. In urban areas, the number of inhabitants exposed to road traffic noise has not decreased. The number of inhabitants who are exposed to high noise levels throughout the day has remained at the same level as in 2012 and is

[13] The completeness was calculated using the following formula: (sum of the reported number of people exposed to Lden ≥ 55 dB/sum of the expected number of people exposed to Lden ≥ 55 dB) × 100. No data have been provided for sources different from "Rails outside urban areas". It must be noticed that few other Members State (Cyprus, Greece, Lichtenstein, Romania and Slovakia) have delivered less complete data.

[14] http://dati.istat.it/Index.aspx?DataSetCode=DCCV_MONINQACS, accessed 18th October 2021.

[15] http://www.arpa.fvg.it/cms/tema/rumore/piani/piani.html, accessed 18th October 2021.

estimated at 64.000. The number of inhabitants who are exposed to noise during the night along major roads in urban areas (around 78.000) has slightly increased (ARSO, 2021 [HR01]).

The number of inhabitants who live along major railways outside urban areas did not change significantly between 2012 and 2017. In 2017, around 7.000 inhabitants were exposed to high noise levels throughout the day and around 10.700 inhabitants during the night. Despite a decrease in the number of inhabitants exposed to noise during the night within urban areas, around 8.800 inhabitants were exposed to high noise levels during the night in 2017 (ARSO, 2021 [HR01]).

5.7.3 Solid and hazardous Waste

Current situation in Italy

In 2019, over 30 million tons of municipal waste were produced in Italy, which correspond to a per capita production of 499 kg/inhabitant. The waste sorting was made for 61,3% of the mass produced. The absolute quantity of municipal waste produced has been substantially stable for a decade, while per capita production –after having significantly decreased between 2006 and 2013– appears to be slightly increasing. The percentage of waste sorted, on the other hand, continues to grow linearly (+5.4% compared to 2018).

About the Programme area, the following figures show the trend of indicators in the various provinces. The Province of Venice alone produces almost the same amount of waste as the entire Friuli Venezia Giulia Region. Total and per capita waste production are fluctuating in the Province of Venice, while generally increasing in all the Provinces of Friuli Venezia Giulia starting from 2012 or 2013. Furthermore, per capita production is above the national average in all provinces. Sorting waste is increasing in all provinces and only in the ex-province of Trieste the figure is lower than the national average.

Year	Province of Venice	Province of Udine	Province of Pordenone	Province of Gorizia	Province of Trieste
2011	509.824	256.246	133.525	72.284	113.412
2012	485.120	245.223	130.189	65.882	109.455
2013	482.848	240.759	131.961	66.587	106.812
2014	482.282	246.216	134.396	66.723	106.099
2015	477.227	252.039	137.746	66.909	105.750
2016	518.974	258.643	143.131	69.477	110.801
2017	497.123	261.783	142.722	71.188	113.325
2018	496.570	264.564	145.847	71.893	113.425
2019	509.868	266.307	149.631	72.706	114.463

Table 5.10: tons of municipal waste produced. Source: National waste cadastre (ISPRA)

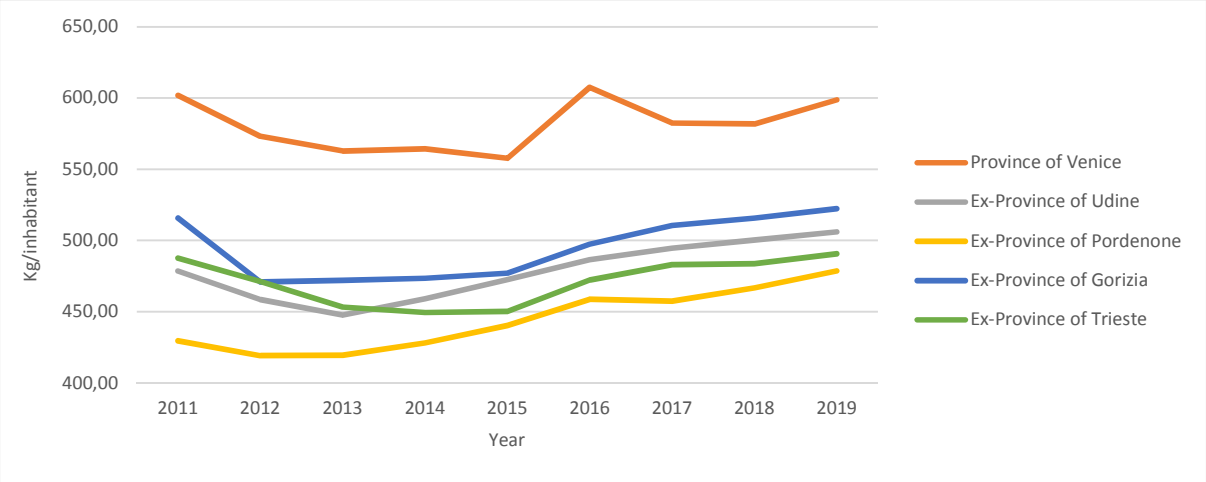


Figure 5.40: municipal waste per capita. Source: National waste cadastre (ISPRA)

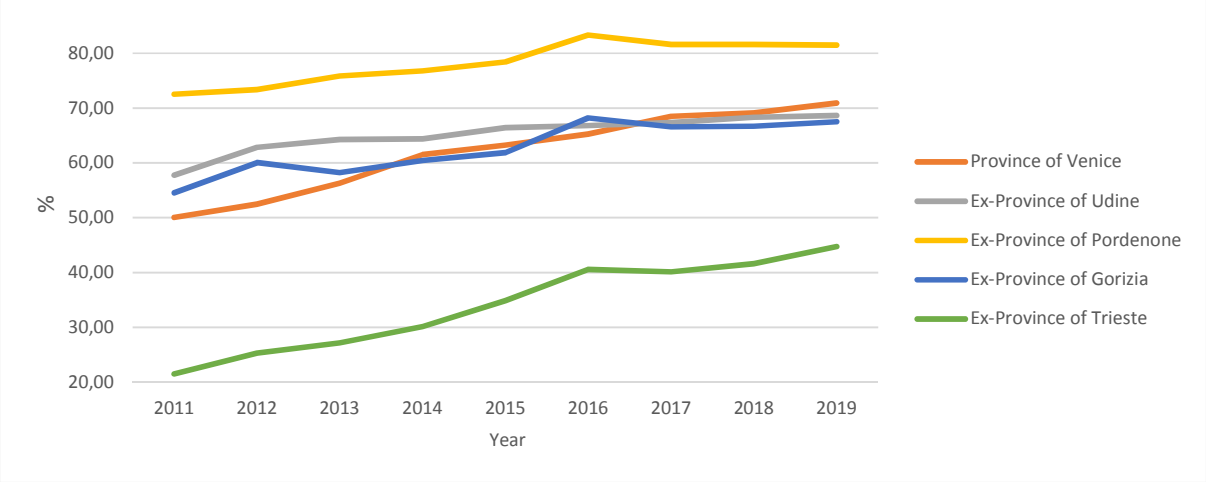


Figure 5.41: Sorted municipal waste percentage. Source: National waste cadastre (ISPRA)

With respect to special waste, in 2019 Italy produced nearly 154 million tons. The trend is strongly increasing: +7% compared to the previous year and +40.5% compared to 2005 (a year after that, there was a large increase in absolute production). On the other hand, of the special waste produced in 2019, only 6,6% are considered hazardous. Their growth is more contained: +1,1% compared to the previous year and +28% compared to 2005. However, the trend is not constantly growing as for all special waste: since 2006, production has decreased until reaching 8,2 million tons in 2011, then it started to grow again.

Only data on a regional scale are available. In 2019, Veneto was the second Italian region for the total production of special (17,3 million tons) and hazardous (1,2 million tons, i.e. 7%) waste. Instead, Friuli Venezia Giulia produced only 4,2 million tons of special waste, of which 6,4% of hazardous waste. In both Regions, the long-term trend is increasing.

In Veneto, the Province of Venice has a significant impact on the production of hazardous waste, due to the presence of the Porto Marghera's chemical hub, in particular for site remediation activities. In Friuli Venezia Giulia the most commonly produced categories of hazardous waste are those from thermal processes, spent oils or liquid fuel residues, and end-of-life vehicles to be demolished and reclaimed.

Current situation in Slovenia

In 2019, more than 8.4 million tons of waste was generated in Slovenia, which amounts to 4 tons per capita respectively around 11 kg per capita per day. The volume almost doubled since 2014 when a little bit more than 4.6 million tons of waste (2,3 tons per capita) was generated. The amount of all

generated waste increased the most in 2018 due to increased amounts of generated construction waste in all activities and all statistical regions (ARSO, 2021 [OD07]; SURS, 2021).

Less than half (41%) of the generated waste was recycled in 2019 and only 2% were deposited. Both shares are decreasing compared to data from 2009 – recycling from 66% and deposition from 20%. On the other hand, other waste recoveries (other final waste recovery operations such as backfilling and the use of waste as a cover) increased from 1% in 2009 to 40% in 2014 and 45% in 2019, while the export of waste increased from 3% in 2009 to 14% in 2014 (13% in 2019) (ARSO, 2021 [OD07]; SURS, 2021).

In Slovenia in 2019, a little more than a million tons of municipal waste was generated (13% of generated waste), which amounts to 509 kg per capita per year respectively around 1.4 kg per capita per day. The volume increased 1.2 times compared to 2014 when a little bit less than 0.9 million tons of waste (433 kg per capita per year) was generated (ARSO, 2021 [OD01]; SURS, 2021).

In the past, most municipal wastes ended up in landfills (82% of municipal waste in 2009). With the change of the legislation, policy instruments and the establishment of municipal waste management centres, the trend of great decline was established due to a greater share of separately collected waste. Also, the municipal waste recycling rate increased in the same period, from 22% in 2010 to 36% in 2014 and 59% in 2019 (ARSO, 2021 [OD01]; SURS, 2021).

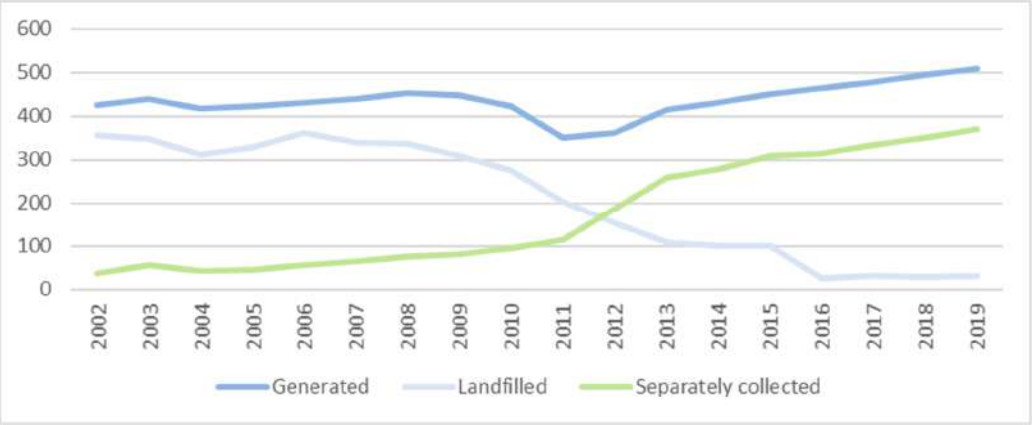


Figure 5.42: municipal waste in Slovenia 2002-2019. Source: SURS, 2021

In the whole country in 2020, 138 296 tonnes of hazardous waste were generated, representing 1.8% of all the waste generated. The total weight of hazardous waste was reduced for 5% compared to year 2019. Approximatelly 5% of the total hazardous waste was municipal waste, the rest was waste, generated from activities (mostly from industry, but in a smaller share also from services). Most of it originated from organic chemical processes and thermic processes (17% of total hazardous waste for each category) as well as disposed vehicles and batteries (16%). The largest share of hazardous waste inside the programme area is recorded for Obalno-kraška and Gorenjska region, and not the Osrednjeslovenska region within which most population is concentrated (SiStat, 2021).

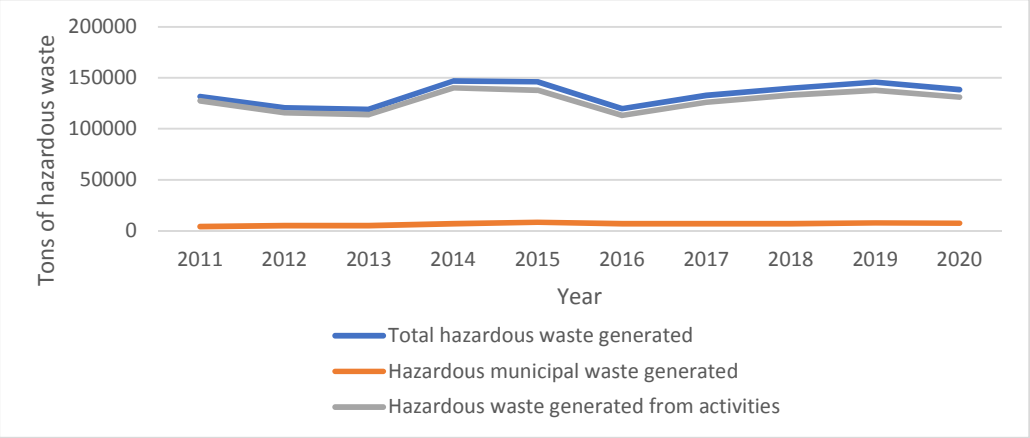


Figure 5.43: hazardous waste in Slovenia 2002-2019. Source: SURS, 2021

5.7.4 Health diseases and healthcare

Current situation in Italy

Life expectancy in Italy in 2018 was on average 83,0 years, and it earned the nation second place in the EU ranking (after Spain). In Friuli Venezia Giulia and in Veneto the average life expectancy was slightly higher, equal to 83,1 years and 83,6 years respectively. The national value is constantly increasing, even if a big improvement took place between 1983 (74,5 years) and 2008 (81,3 years). A trend like the national one is recorded in the Programme Area, but more significant, because in 1983 both regions were below the Italian average. The healthy life expectancy of the two Regions of the Program Area is slightly higher than the national average in 2018 (58,5 years): 59 years in Veneto and 60 years in Friuli Venezia Giulia, but with stationary short-term trend.

The Programme area registers values below the national average for many health indicators: death rate for infectious diseases (with the exception of the ex-Province of Pordenone), cancer death rate, death rate from mental disorders, death rate from suicide. Lifestyles are generally healthier than in the rest of Italy, although there are exceptions (for example alcoholism). The hospital beds occupancy ratio is generally lower than the national average, with the exception of the Province of Venice. Per capita public health expenditure is growing in both regions (as well as in Italy), even if in Veneto the value is still lower than the national average.

	Province of Venice		Province of Udine		Province of Pordenone		Province of Gorizia		Province of Trieste		Italy	
	2018	2010	2018	2010	2018	2010	2018	2010	2018	2010	2018	2010
Death rate from infectious diseases	3,39	1,72	2,61	1,79	2,08	1,40	3,08	1,89	2,81	2,83	2,29	1,57
Cancer death rate	33,04	31,92	36,35	36,34	29,30	30,58	39,38	38,24	40,46	42,99	29,89	28,85
Death rate from mental disorders	7,49	4,09	5,50	4,53	4,16	2,64	4,30	3,23	4,48	2,87	4,09	2,42
Death rate from accidents	0,62	0,99	0,96	0,94	0,61	0,95	0,57	0,91	0,38	0,68	0,57	0,71
Death rate from suicide	0,68	0,75	1,10	0,81	1,18	1,05	1,08	0,84	0,68	0,68	0,62	0,64
Hospital bed utilization rate	83,08	82,84	78,54	74,80	74,04	64,89	77,94	70,81	79,83	82,82	80,70	80,26

Table 5.11: health indicators (provincial detail). Source: Health for all software.

	Friuli Venezia Giulia			Veneto			Italy		
	2019	**2015**	**2013**	**2019**	**2015**	**2013**	**2019**	**2015**	**2013**
Severe chronic disease rate (at least one)	136,27	174,31	155,72	131,59	128,18	147,34	147,22	154,96	151,59
Percentage of smokers	17,87	18,64	19,30	15,79	17,38	18,73	18,63	19,82	21,08
Alcoholism risk behavior rate	20,02	22,20	-	21,10	20,30	-	16,70	16,40	-
Percentage of healthy eater	59,22	61,73	61,34	55,39	59,17	58,06	49,52	52,63	51,40
Percentage of sedentary people	25,23	29,77	28,37	23,19	27,04	24,44	35,62	39,88	41,17
Public health expenditure per capita	2.297	2.008	2.020	1.792	1.745	1.704	1.904	1.800	1.810

Table 5.12: health indicators (regional detail). Source: Health for all software.

According to the 2019 report on 2017 data of the National Health System (SSN), 201 public health agencies are present in Italy; 8 of these are located in Friuli Venezia Giulia and 12 in Veneto. From 2010 to 2017, the number of employees in these agencies decreased.

Taking the ratio between the available staff and the 'equivalent population' (which considers the different use of healthcare according to age), in Italy there are on average 10 personnel for every thousand 'equivalent patients'. According to this indicator, Friuli Venezia Giulia is the second largest region in Italy in terms of welfare, with approximately 14 staff units per 1000 assisted; the value is slightly decreasing compared to 2010. Veneto is in 13th place, but still above the national average, with almost 11 units; again, the value is slightly lower to the 2010 one.

In Italy there are 215.000 public and private healthcare beds in 2016. This value is registering a strong negative trend (-12% compared to 2010 and -60% compared to 1981). The cuts mainly affected the public sector, in the whole national territory, including the Programme area (fig. 5.39), where, however, the public supply is above the national average and more stable in recent years.

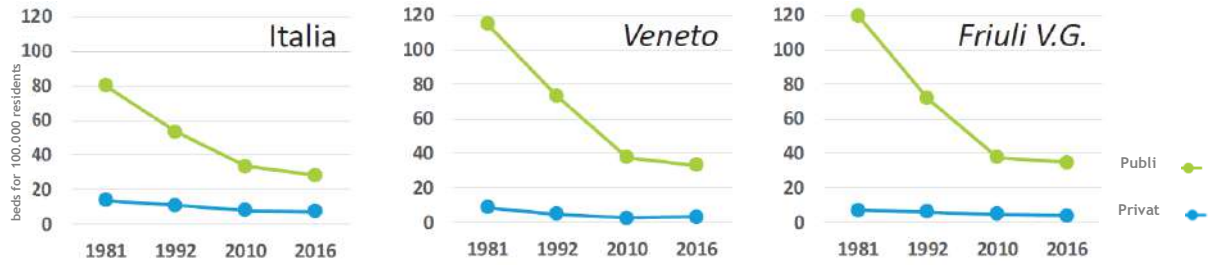


Figure 5.44: public and private hospital offer. Source: SSN (2018)

Current situation in Slovenia

Life expectancy in Slovenia is getting longer for men and women. In the year 2016, life expectancy for women was 84, and 78 for men. In recent years, there was a notable rise in life expectancy in western Slovenia (ARSO, 2021 [ZD26]). The number of healthy life years in 2018 amounted to approximately 60 for both genders, which is among the lowest values among OECD members (OECD, 2020). The average death rate due to heart diseases has significantly decreased in the last 30 years (to 74 per 100 000 inhabitants for 2015-2019) and western Slovenia shows even lower values compared to the average. The average death rate due to cancer is 160/100 000 inhabitants; the death rate due to suicide is 20/100 000 inhabitants, which is extremely high (OECD, 2020), however, western Slovenia is again showing better rates compared to the national average. In 2015-2019, there have been on average 1.4 injured in traffic accidents per 100 000 inhabitants in Slovenia (NIJZ, 2021).

In western Slovenia, children are showing an above-average movement efficiency compared to the rest of Slovenia; approximately 20% of them are overeating. On average, 8% of traffic accidents are caused by intoxicated people (NIJZ, 2021). In 2019, 17% of inhabitants, older than 15 years were

smoking, 57% are overweight, 43% of inhabitants have been highly intoxicated (alcohol) (NIJZ, 2021; OECD, 2021).

In 2020, 23% of inhabitants assessed their health as very good, 44% as good, 23% as fair, and 10% as bad or very bad. In 2019, healthcare expenditures reached the highest point in 10 years with 4 124 915 000 EUR, representing a 9% increase compared to the previous year (SiStat, 2021).

In 2019, there were 3.3 doctors per 1000 inhabitants and 10.3 nurses per 1000 inhabitants. There were 4.4 hospital beds available per 1000 inhabitants (same as the OECD average), but the number of medical equipment was considerably lower than in other countries (based on the year of 2013). Patients spent on average 6.9 days in hospitals, which is shorter compared to the OECD average of 7.6. With most of the medical care quality indicators, Slovenia is performing around average among OECD countries; there is however a low vaccination incidence that is worrying (only 19% of inhabitants over 65 have had their flu shot in 2019). Slovenia spends less than average for healthcare compared to OECD members but achieves higher life expectancy overall, which may indicate relatively good value for-money of the health system, even though many other factors also have an impact on health outcomes (OECD, 2021).

5.7.1 Exposure to flood risk

Current situation in Italy

Based on the report of the Higher Institute for Environmental Protection and Research of Italy - ISPRA (Trigila *et al*, 2018) regarding hydrogeological instability, in Italy 32.961 km^2 (10,9% of the national territory) are subject to hydraulic hazards (from low to high); of these, 12.993 km^2 (4,3%) are exclusively subject to medium danger, while 12.405 km^2 (4,1%) are exclusively subject to high danger. This correspond to 9.341.533 inhabitants (15,7% of the total resident population) subject to hydraulic hazards (from low to high), of which 4.120.889 inhabitants (6,9%) are exclusively subject to medium danger and 2.062.475 inhabitants (3,5%) are exclusively subject to high danger.

The data relating only to the Programme area are shown in the following table:

Area	% territory				% population			
	Low danger	Medium danger	High danger	In danger	Low danger	Medium danger	High danger	In danger
Province of Venice	31,0	6,5	16,7	54,2	44,4	4,8	15,5	64,7
Province of Pordenone	0,6	0,1	1,7	2,4	4,1	0	1,6	5,7
Province of Udine	0,9	7,2	2,5	10,6	1,7	11,2	0,6	13,5
Province of Gorizia	6,5	5,1	14,6	26,2	8,2	3,1	5,6	16,9
Province of Trieste	0,4	0,2	0,3	0,9	0,6	0,3	0,3	1,2

Table 5.12: flood risk in the Programme area. eco&eco processing on ISPRA data (2018)

In the medium to long term, an increase in risk due to climate change is to be expected; this is particularly true for coastal and floodplain areas, which are considered particularly vulnerable areas to sea level rise and increase in intense rainfall (IPCC, 2014).

Current situation in Slovenia

Considering the data from 2013, 7% of people lived in flood-prone areas in Slovenia. The most extensive flood areas are outside of the programme area, in the northeast and subpannonian Slovenia. The largest share of the population living in flood-prone areas within the programme area is in Osrednjeslovenska statistical region with the share of 9% (ARSO, 2021 [ZD24]).

Flood risk management plan 2017-2021 is based on the fact that measures within 61 areas with a significant impact of floods have to be implemented within each of 17 sub-basins. Areas with a significant impact of floods covered 11 079 ha in 2017 and 128 650 people lived within those areas (NZPO SI, 2017). Since 86 areas with a significant impact of floods were defined in 2020 and they

cover 14 001 ha it is expected that more people are affected by flood risk nowadays (MESP, 2020).

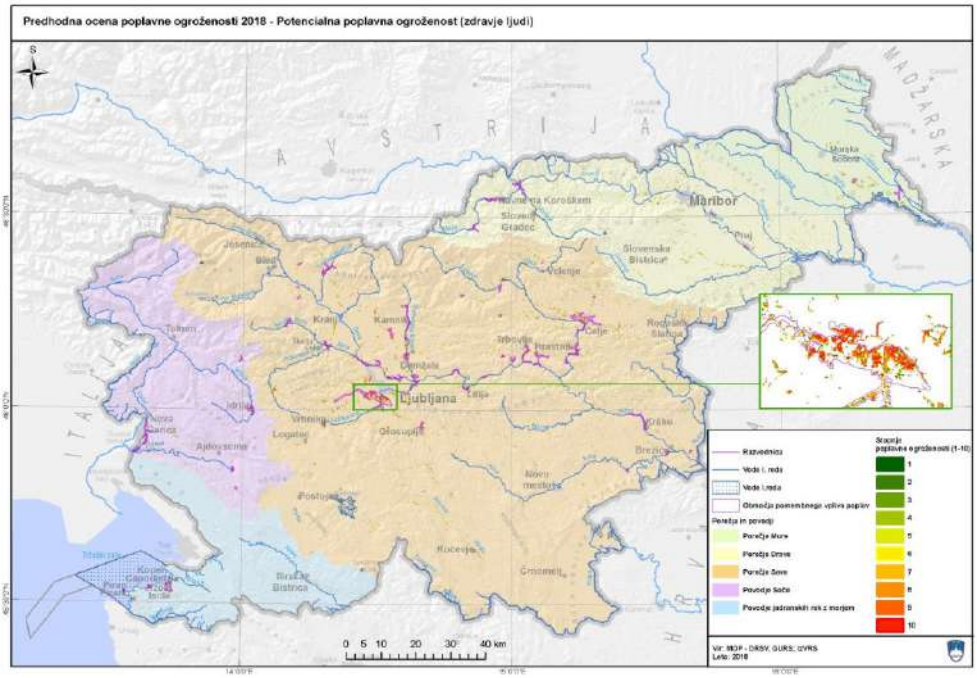


Figure 5.44: potential flood risk areas – human health (MESP, 2019)

Assessment of the development according to the zero alternative

Environmental aspect	Indicators	Last available data and description of trend	ZA
Exposure to pollution	Population exposed to air pollution	IT* (2019): About 1,5 million people subject to ozone pollution, about 900.000 also subject to fine particulate pollution. Comparison with the previous four-year period → stable/slightly improving trend	↗ ↔
		SI (2021): 47% of children exposed to concentrations of 21-30 µg PM10/m3, and 53% to concentrations of 31-40 µg/m3 (in Europe, most children live where PM10 concentrations are below 30 µg/m3).	↗
Noise pollution	Population exposed to excessive noise levels	IT (2020): at least 25,7% of the Italian population exposed to significant noise levels (> 55 dB). In general, a worsening of the situation is expected in Europe, but in Italy the population is declining since 2012, so the effect could be dampened	↔ ↘
		SI (2017): 112,306 inhabitants lived in the impact area of roads and 19,482 inhabitants in the impact area of rails. The number has decreased between 2012 and 2017. In urban areas, the number throughout the day has remained at the same level (slightly increased during the night)	↗
Solid and industrial waste	Generated solid waste per capita	IT* (2019): with a production of 539 kg/inhabitant, the Program area is well above the Italian average (499 kg/inhabitant). The five-year trend is worsening (+39 kg/inhabitant)	↘
		SI (2019): generated municipal waste volume amounted to 509 kg/capita/year, 1.4 kg/capita/day. The volume increased 1.2 times since 2014 when a little less than 0.9 million tons of waste (433 kg per capita per year) was generated	↘
	Selected solid waste	IT* (2019): About 69% of the solid waste is sorted (only province of Trieste below the national average). The time series shows a constantly growing trend in all provinces	↗
		SI (2019) With the change of the legislation, policy instruments and the establishment of municipal waste management centres, a greater share of separately collected waste. Therefore, 73% of municipal waste collected separately (from 18% in 2009 and 65% in 2014). Also, the municipal waste recycling rate increased in the same period, from 22%	↗

		in 2010 to 36% in 2014 and 59% in 2019	
Health diseases and healthcare	Life expectancy	IT* (2018): In Friuli Venezia Giulia and Veneto the average life expectancy is equal to 83,1 years and 83,6 years respectively, both above the national average (which is among the highest in Europe). The trend is increasing for decades	↗
		SI (2016/2020): In the year 2016, life expectancy for women was 84, and 78 for men. In recent years, there was a notable rise in life expectancy in western Slovenia.	↗
	Equivalent personnel' for every thousand 'equivalent patient	IT* (2017): Ratio medical staff/'equivalent population' high for Friuli Venezia Giulia (14 staff units per 1000 assisted people, 2nd in Italy; slightly decreasing compared to 2010), above the national average for Veneto (11, 13th in Italy, slightly decreasing compared to 2010)	←→ ↘
		SI (2019): There are 3.3 doctors per 1000 inhabitants and 10.3 nurses per 1000 inhabitants. There are 4.4 hospital beds available per 1000 inhabitants, but the number of medical equipment was considerably lower than in other countries (based on the year of 2013).	↘
Exposure to flood	Population exposed to flood	IT* (2018): The percentage of the population subject to medium to high flood risk varies greatly depending on the province in question. The province of Venice is the most exposed (more than 20%) followed by the provinces of Udine (almost 12%), Gorizia (almost 9%), Pordenone (1,6%) and Trieste (0,6%). In the mid- long term, an increase in risk due to climate change is to be expected; this is particularly true for coastal and floodplain areas	←→ ↘
		SI (2013): 7% of people lived in flood-prone areas in Slovenia. The most extensive flood areas are outside of the programme area, in the northeast and subpannonian Slovenia. The largest share of the population living in flood-prone areas within the programme area is in Osrednjeslovenska statistical region with the share of 9%.	↗
↑ Improving trend; ↗ Partially or gradually improving trend; ←→ Unchanged trend; ↘ Partially or gradually deteriorating trend; ↓ Deteriorating trend			

6. Assessment of potential environmental impacts

Environmental aspects	Indicators	ZA trends	Identified IP impacts and their type	
Air	Average emission levels of the main air pollutants (NOx, PM10, PM2,5, O3, SO2)	↗ ↔ (IT) ↗ ↔ (SI)	+ Improved air quality – reduce of PM concentration in urban areas due to expansion of green areas, and promotion of sustainable multimodal urban mobility (SO 2.4, 2.7, 4.6, ISO 1b) + Improved air quality – reduce of PM and ground ozone due to expansion of green areas and consequently possible reduction of the urban heat islands (SO 2.7) + Improved air quality due to promotion of circular economy (reduced emissions due to lower demand for waste management, reduced demand for transport services due to a shared economy) (SO 2.6) – Higher emission levels of the air pollutants (CO, NMVOC, NOx, PM10, PM2.5) due to increased traffic flows, especially in touristic areas (SO 4.6).	+/-
Climate	Greenhouse gas emissions	↘ ↔ **(IT)** ↗ **(SI)**	+ Reduction in GHG emission (SO 2.4, 2.6, 2.7, 4.6, ISO 1b) + Improved knowledge and skills on circular economy, digitalization and advanced technologies, transferred best practices and implemented pilot projects, which all might result in overall reduction of the environmental footprint of economy within the programme area (SO 1.1, 2.6) + Improved resilience due to newly developed tools and actions aimed at adaptation to climate change and mitigation of effects on the territory (SO 2.4) + Improved preparedness and response due to improved risk management systems and joint action plans and rescue protocols (SO 2.4) + Improved awareness on climate change and their consequences, especially on local level (SO 2.4) + The shift towards a more circular economy (SO 2.6) + Preserved natural capital and its improved management. Improved sinks and mitigated climate change consequences due to promoted green and blue infrastructure (SO 2.7) + Improved sustainable mobility infrastructure and subsequently mitigated negative impact from increased tourism flows (SO 4.6, ISO 1b) + A more sustainable tourism (SO 4.6) – Increased pressures to environment due to increased and dispersed tourism flows (SO 4.6)	+/-
	Share of renewable energy in gross final energy consumption	↔ **(IT)** ↗ **(SI)**		**0**
	Final energy consumption	↗ (IT) ↗ (SI)		**0**
Water	Ecological and chemical status of surface water bodies	↘ ↔ (IT) ↘ ↔ (SI)	+ Increased networking and cooperation in nature conservation (SO 2.4, 2.6, 2.7, ISO 1.b) + Circulation on information on common environmental issues (SO 1.1, 2.4, 4.6) + Improved knowledge and skills on circular economy, digitalization and advanced technologies, transferred best practices and implemented pilot projects, resulting in overall reduction of the env. footprint within the programme area (SO 1.1, 2.6). + Efficient management of hydraulic risk (SO 2.4) + Development of green Technologies for a cross border water management (SO 2.4, 2.6, ISO 1b) + Improved monitoring and management of target water basins and rivers (SO 2.4, ISO 1b) + Preserved natural capital and its improved management (SO 2.7)	+/-

			+ Reduction in water pollutants (SO 2.7) + Improvement and conservation of the coastal and marine habitat (SO 2.7) + A more sustainable tourism (SO 4.6) – Increased pressures to environment due to increased and dispersed tourism flows (water pollution) (SO 4.6)	
	Chemical status of groundwater bodies	↔ (IT) ↔ (SI)	+ Improved monitoring and management of target water basins and rivers (SO 2.4, ISO 1b) + Improvement in environmental performance in SMEs (SO 2.6) + Green technologies for the sustainable enhancement (vineyards, gardens, parks) (SO 2.6) + Reduction in pesticide use (SO 2.6, 2.7) + Preserved natural capital and its improved management (SO 2.7) + Reduction in water pollutants (SO 2.7) + Improved condition (state) and management of natural heritage and protected areas (SO 2.7, 4.6, ISO 1.b) – Potential negative impact of new infrastructures (mobility infrastructures) (SO 4.6) – Increased pressures to environment due to increased tourism flows (water pollution) (SO 4.6)	+
	Quantitative status of groundwater	↔ (IT) ↔ (SI)	+ Improved monitoring and management of target water basins and rivers (SO 2.4, ISO 1b) – increased pressure due to agriculture related activities (SO 2.6, 2.7) – increased pressures due to increased tourism flows (water consumption) (SO 4.6)	0
	Water Exploitation Index	↔ (IT) ↔ (SI)	+ Improved monitoring and management of target water basins and rivers (SO 2.4, ISO 1b) – Increased pressure due to agriculture related activities (SO 2.6, 2.7) – increased pressures due to increased tourism flows (water consumption) (SO 4.6)	0
Soil	Land take	↘ (IT) ↘ (SI)	+ Improved knowledge and skills on circular economy processes, transferred best practices and implemented pilot projects, which all might result in overall reduction of the environmental footprint within the programme area (SO 1.1, 2.6). + Reduced soil loss due to activities counteracting effects of climate change (SO 2.4). + Improved management and use of natural resources and shift towards a more circular economy (SO 2.6). + Protection of ecosystems, development of ecological quality in agriculture, limiting anthropogenic pressures (SO2.7). + Reduced pollution of soils due to improved sustainable multimodal mobility (ISO 1b). – Soil loss and sealing due to small-scale infrastructure investments (SO 2.4) and cycling and e-mobility infrastructures (SO 4.6, ISO 1b) – Increased pressures to environment due to increased and dispersed tourism flows (soil sealing, increased waste production) (SO 4.6)	-
	Land use/cover change by categories	↘ (IT) ↘ (SI)		+/-
	Area of functionally degraded areas	↘ (IT) ↘ (SI)		**0**
	Quality of soil and soil pollution	↘ (IT) ↔ (SI)		+/-
Biodiversity	Development of nature protection areas (by categories)	↔ (IT) ↗ (SI)	+ Reduce of PM concentration in urban areas due to expansion of green areas, and promotion of sustainable multimodal urban mobility (SO 2.4, 2.7, 4.6, ISO 1b) + Overall reduction of environmental footprint (SO 2.4, 2.6, 2.7, 4.6) + New research on environmental protection (SO	+

		2.4, 2.7) + Reduction in pesticide use (SO 2.6, SO 2.7) + Reduction in the use of raw materials (SO 2.6) + Improved management, environmental accessibility and risk management (SO 2.4) + Reduction in GHG emission (SO 2.4, 2.6, 2.7, 4.6, ISO 1b) + Improved condition (state) and management of natural heritage Natura 2000 areas and protected areas (SO 2.7, 4.6, ISO 1.b) + Improved monitoring of Natura 2000 sites (SO 2.7, 4.6, ISO 1b) + Reduction in water pollutants (SO 2.7) + Improved knowledge and skills on biodiversity (SO 2.4, 2.6, 2.7, ISO 1b) + Green technologies for sustainable enhancement (vineyards, gardens, parks) (SO 2.6) + Improved condition (state) and management of natural heritage and protected areas (SO 2.7, 4.6, ISO 1b) + Circulation on information on common environmental issues (SO 2.4, 4.6) + Increased networking/cooperation in the field of nature conservation (SO 2.4, 2.7, ISO 1b, ISO 1c) + A more sustainable tourism (SO 4.6) – Increased pressures to environment due to increased tourism flows (disruption of flora/fauna in protected areas and Natura 2000) (SO 4.6) – Impact of new infrastructures (energy sites, e-mobility infrastructures) (SO 2.7, 4.6) – Increased pressure due to agriculture related activities (SO 2.6, 2.7)	
Favourable condition of species of European interest	↘ (IT) ↘ (SI)	+ Improved knowledge and skills on biodiversity (SO 2.4, 2.6, 2.7, ISO 1b) + New research on env. protection (SO 2.4, 2.7) + Reduction in pesticide use (SO 2.6, 2.7) + Improved condition (state) and management of natural heritage Natura 2000 areas and protected areas (SO 2.7, 4.6, ISO 1b) + Improved monitoring of Natura 2000 sites (SO 2.7, 4.6, ISO 1b) + Geen technologies for the sustainable enhancement (vineyards, gardens, parks) (SO 2.6) + Improvement and conservation of the coastal and marine habitat (SO 2.7) + Increased networking and cooperation in nature conservation (SO 2.4, 2.7, ISO 1b, ISO 1c) – Increased pressures to environment due to increased tourism flows (disruption of flora/fauna in protected areas and Natura 2000) (SO 4.6) – Impact of new infrastructures (energy sites, e-mobility infrastructures) (SO 2.7, 4.6) – increased pressure due to agriculture related activities (SO 2.6, 2.7)	+/-
Favourable condition of habitats of European interest	↗ (IT) ↗ (SI)	+ Improved knowledge and skills on biodiversity (SO 2.4, 2.6, 2.7, ISO 1b) + New research on environmental protection (SO 2.4, 2.7) + Improved condition (state) and management of natural heritage Natura 2000 areas and protected areas (SO 2.7, 4.6, ISO1.b) + Improved monitoring of Natura 2000 sites (SO 2.7, 4.6, ISO 1b) + Reduction in water pollutants (SO 2.7) + Improvement and conservation of the coastal and marine habitat (SO 2.7)	+/-

			+ Increased networking/cooperation in the field of nature conserv. (SO 2.4, 2.6, 2.7, ISO 1b, ISO 1c) + Development of green technologies for a cross-border water management (SO 2.4, 2.6, ISO 1b, ISO 1c) – Increased pressures to environment due to increased tourism flows (disruption of flora/fauna in protected areas and Natura 2000) (SO 4.6) – Impact of new infrastructures (energy sites, e-mobility infrastructures) (SO 2.7, 4.6) – increased pressure due to agriculture related activities (SO 2.6, 2.7)	
Landscape and cultural heritage	Registered units of cultural heritage	↗ (IT) ↘ (SI)	+ Improved quality of tourism supply (with prolonged time of stay) (SO 2.7, 4.6) + Improved state and management of natural heritage and protected areas (SO 2.7, 4.6, ISO 1b) - Adverse impacts on tangible and intangible attributes of cultural and natural heritage (SO 4.6) – Impact of new infrastructures (energy sites, e-mobility infrastructures) (SO 2.7, 4.6)	0
	Intangible cultural heritage	↗ (IT) ↘ (SI)	+ Realization of sust. tourism visits (SO 2.8, 4.6) + Improved quality of tourism supply (with prolonged time of stay) (SO 2.7, 4.6) – Adverse impacts on tangible and intangible attributes of cultural and natural heritage (SO 4.6)	0
	Extension of protected landscapes	↗ (IT) ↗ (SI)	+ Reduction in pesticide use (SO 2.6, 2.7) + Improved condition (state) and management of natural heritage Natura 2000 areas and protected areas (SO 2.7, 4.6, ISO 1b) + Green technologies for the sustainable enhancement (vineyards, gardens, parks) (SO 2.6) + Efficient management of hydraulic risk (SO 2.4) + Realization of sus. tourism visits (SO 4.6) + Improved quality of tourism supply (with prolonged time of stay) (SO 2.7, 4.6) + Improved state and management of natural heritage and protected areas (SO 2.7, 4.6, ISO 1b) + Increased networking and cooperation in the field of nature conserv. (SO 2.4, 2.6, 2.7, ISO 1b, ISO 1c) + A more sustainable tourism (SO 4.6) – Increased pressures to environment due to increased tourism flows (disruption of flora and fauna in protected areas and Natura 2000 sites) (SO 4.6) – Adverse impacts on tangible and intangible attributes of cultural and natural heritage (SO 4.6) – Impact of new infrastructures (energy sites, e-mobility infrastructures) (SO 2.7, 4.6)	0
	Risk of agricultural land abandonment	↔ (IT) ↘ (SI)	+ Green technologies for the sustainable enhancement (vineyards, gardens, parks) (SO 2.6) – Increased pressures to environment due to increased tourism flows (higher soil and water pollution, higher water consumption) (SO 4.6) – Impact of new infrastructures (energy sites, e-mobility infrastructures) (SO 2.7, 4.6)	0
	Landscape fragmentation	↘ (IT) ↘ (SI)	+ Improved condition (state) and management of natural heritage Natura 2000 areas and protected areas (SO 2.7, 4.6, ISO 1b) + Green technologies for sustainable enhancement (vineyards, gardens, parks) (SO 2.6) + Increased networking and cooperation in the field of nature conservation (SO 2.4, 2.6, 2.7, ISO 1b, 1c) – Increased pressures to environment due to increased tourism flows (disruption of flora and fauna in protected areas and Natura 2000) (SO 4.6)	+/-

			– Impact of new infrastructures (energy sites, e-mobility infrastructures) (SO 2.7, 4.6)	
Human health and well-being	Number of people exposed to air pollution	↗ ↔ (IT) ↗ (SI)	+ Improved quality of life and well-being due to new employment opportunities and actions aiming at overall improvement of the economic and social situation (SO 1.1, 2.6, 4.6) + Improved environmental and public health, as well as overall living conditions due to more green areas in urban centres (SO 2.7) + Improved environmental and public health, as well as overall living conditions due to reduce traffic congestions and consequently air and noise pollution (SO 2.4, ISO 1b) + Decrease in share of population exposed to climate change risks (floods) + Improved quality of life and well-being by strengthening public administration and involving local actors in the design and realisation of multisectoral interventions for integrated local development. (ISO 1b, ISO 1c) – Risk to public health due to higher emission levels of air pollutants (CO, NMVOC, NOx, PM10, PM2.5) and exposure to noise due to increased traffic flows, especially in touristic areas (SO 4.6).	+/-
	Population exposed to excessive noise levels	↔ ↘ (IT) ↗ (SI)		+/-
	Generated solid waste per capita	↘ (IT) ↘ (SI)		+/-
	Selected solid waste	↗ (IT) ↗ (SI)		+/-
	'Equivalent personnel' for every thousand 'equivalent patients'	↔ ↘ (IT) ↘ (SI)		0
	Number of people affected by flood risk	↔ ↘ (IT) ↗ (SI)		+

Zero Alternative (ZA) foreseen development:
↑ Improving trend; ↗ Partially or gradually improving trend; ↔ Unchanged trend; ↘ Partially or gradually deteriorating trend; ↓ Deteriorating trend

Assessment of the Interreg Programme (IP) in Comparison to the ZA:
\+ **potential improvement;** 0 **no relevant change;** – **potential deterioration;** x **no assessment at this stage**

Significance:
! **potentially significant impact**

Table 6.1: Potential impacts related to each specific environmental aspect

6.1 Air

The assessment is based on Priorities (PO), Specific Objectives (SO), Actions (A) and their relating exemplary actions – all in detail presented in chapter "1. Overview of draft Programme". The assessment considered the following environmental issues established through the review of the relevant environmental objectives in chapter 4:

- Impacts on human health and well-being
- Impacts on ecosystems

Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Objectives	Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Actions	Benefits & risks			Explanation
		+	-	TB	
SO 1.1 - Developing and enhancing research and innovation capacities and the uptake of advanced technologies	Promoting a cross-border ecosystem for R&D and strengthening the innovation capacities of local actors	0	0	0	The IP includes various interventions, which are expected to contribute to better air quality. The SOs that will mainly contribute to achieving the reduction of emission levels and improved air quality in urban and non-urban areas is SO 2.7, due to expansion of green areas in urban areas which may reduce PM concentrations. Also, reduction of the urban heat island effect may reduce the formation of ground ozone, etc. Contribution to the improved air quality can be expected also from the action under SO 2.6 with the emphasis on sustainability on logistic, delivery, mobility services, circular economy modalities; and SO 4.6, mostly with respect to the implementation of macro- regional connections (ADRIONCYCLETOUR cycle route strategic project). A partial contribution to improved air quality could come from ISO 1b, that considers "Supporting strategies for multimodal accessibility in view of a better and sustainable connectivity among urban, rural and coastal areas". While the proposed actions aim to support sustainable solutions that, as a side effect help to reduce transport-
SO 2.4 - Promoting climate change adaptation and disaster risk prevention, and resilience, taking into account ecosystem based approaches	Fostering resilience capacity to climate change and mitigating risks related to natural disasters	0	0	0	
SO 2.6 - Promoting the transition to a circular and resource efficient economy	Developing shared model/solutions for the circular economy	+1	0	0	

SO 2.7 - Enhancing protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution	Conservation, protection, promotion of the cross-border area natural capital	+2	0	0
SO 4.6 - Enhancing the role of culture and sustainable tourism in economic development, social inclusion and social innovation	Preservation, maintenance and promotion of the cultural heritage, implementation of sustainable and innovative practices in tourism, support to education and training to foster employability and social inclusion	+1	-1	0
ISO 1.(b) - Enhance efficient public administration by promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular, with a view to resolving legal and other obstacles in border regions	Increasing governance capacity to optimize services for citizens	+1	0	T+
ISO 1.(c) - Build up mutual trust, in particular by encouraging people-to-people actions	Supporting small-scale projects through people-to-people cross-border initiatives	0	0	0

related air pollution, the actual reductions of the air emissions cannot be take for granted – e.g. PM is partly derived from the movement of vehicles regardless of their fuel source. To this end, we recommend encouraging the project applicants to deploy 'sustainability-by-design' approach that examines whether and how their proposed actions reduce the need for transport; reduce or optimize the transport flows; and support switching to least emission-intensive fuels. At the same time, it will be important to ensure that proposals for new infrastructure development include assessment of potential transboundary impacts if and when required under the EIA Directive and Espoo Convention. Albeit the implementation of the ADRIONCYCLETOUR is generally expected to have positive impact on air quality, potential indirect adverse impact could be linked to increased overall pressures to the environment due to increased and dispersed tourism flows and consequently increased traffic in touristic areas where high pressures from tourism and transport sectors already exists. For this reason, we suggest to encourage the potential linkages between the ISO 1b(non-urban multimodal transport) and SO 4.6, and project applicants to deploy 'environmental sustainability by design' approach, which should take into account potential increase of tourist flows.

No impacts are expected on air quality due to implementation of activities under the SOs 1.1, 2.4 and ISO 1c.

None of exposed impacts have the character of synergic impacts. Transboundary impact could be expected only for ISO 1b due to improved sustainable multimodal mobility and its infrastructure, increasing the use of sustainable transport options (for daily use and tourism purposes) within and beyond the programme area and resulting in reduced pollution and decreased pressures.

Based on above provided assessment, we can conclude that the IP will have no significant direct, indirect, cumulative, synergic or transboundary adverse impacts on the environmental aspect *"Air"*. However, the IP is expected to have significant and non-significant positive impacts. The occurrence of both depends greatly on types of projects to be supported.

Since there are no significant direct, indirect, cumulative, synergic or transboundary negative impacts on the environmental aspect *"Air"*, no additional alternatives are proposed. Nonetheless, the SEA team provides the following mitigation measure to address the exposed non-significant negative impact:

- The IP should encourage all applicants to use *'environmental sustainability by design'* approach, which should take into account potential increase of tourist flows; for example, in the dedicated section of the project application templates. Subsequently, the IP should prefer to co-finance projects with sustainable solutions integrated in project design.

In order to enhance positive impact of activities under ISO 1.(b) and SO 4.6. (including strategic project ADRIONCYCETOUR) we suggest the following measure:

- The IP should encourage the applicants to consider potential linkages between actions within ISO 1.(b) (non-urban multimodal transport) and SO 4.6 (ADRIONCYCETOUR)

With respect to DNSH, the absence of significant negative impacts on any manifestation of the *Air* ensures the complying of the principle. As a matter of facts, the only signalled negative impact is related to potential tourism pressure coming from SO 4.6, so that the proposed mitigation measure (encouraging all applicants applying to 4.6 to use *"environmental sustainability by design"* approach) is applicable and sufficient to comply with the DNSH principle.

6.2 Climate

The assessment is based on Priorities (PO), Specific Objectives (SO), Actions (A) and their relating exemplary actions – all in detail presented in chapter *"1. Overview of draft Programme"*. The assessment considered the following environmental issues established through the review of the relevant environmental objectives in chapter 4:

- Climate change mitigation
- Climate change adaptation

Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Objectives	Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Actions	Benefits & risks			Explanation
		+	-	TB	
SO 1.1 - Developing and enhancing research and innovation capacities and the uptake of advanced technologies	Promoting a cross-border ecosystem for R&D and strengthening the innovation capacities of local actors	+1	0	0	It is clear, both from the content of the IP and from the scoring in this table, that climate change adaptation and mitigation is one of key topics. Subsequently, the IP is expected to have predominantly positive impacts on both relevant environmental objectives. We expect positive impacts of the IP on "Climate", as listed in the introduction table to this chapter, to occur during the life- time of IP. However, it has to be noticed that climate change and their consequences represent one of the major global challenges and it would be unreasonable to expect significant contribution to that challenge from a bilateral cross-border programme. Nonetheless, this IP plans to support important efforts in this direction; thus, we can reasonably expect some proposed actions to have significant positive impacts. They are, especially those linked to SOs 2.4 and 2.7, predominantly related to climate change adaptation. With actions like *"Application of joint tools to counteract the effects of climate change and extreme events and to improve quality of life in the cross-border space "*, *"small infrastructures for risk prevention and management, also with bio-engineering techniques"*, *"coordinated rescue*
SO 2.4 - Promoting climate change adaptation and disaster risk prevention, and resilience, taking into account ecosystem based approaches	Fostering resilience capacity to climate change and mitigating risks related to natural disasters	+2	0	T+	
SO 2.6 - Promoting the transition to a circular and resource efficient economy	Developing shared model/solutions for the circular economy	+1	0	0	

SO 2.7 - Enhancing protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution	Conservation, protection, promotion of the cross-border area natural capital	+1	0	0
SO 4.6 - Enhancing the role of culture and sustainable tourism in economic development, social inclusion and social innovation	Preservation, maintenance and promotion of the cultural heritage, implementation of sustainable and innovative practices in tourism, support to education and training to foster employability and social inclusion	+2	-1	T+
ISO 1.(b) - Enhance efficient public administration by promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular, with a view to resolving legal and other obstacles in border regions	Increasing governance capacity to optimize services for citizens	+1	0	0
ISO 1.(c) - Build up mutual trust, in particular by encouraging people-to-people actions	Supporting small-scale projects through people-to-people cross-border initiatives	0	0	0

protocols and actions" or *"promoting green and blue infrastructures"*, the IP is predominantly aiming towards a more climate change resilient programme area. The more pressing issue from the global perspective, climate change mitigation, is on the other hand tackled more indirectly through actions liked to SO 2.6 (e.g. *shift towards circular economy*) and – partially – ISO 1b (e.g. *supporting strategies for multimodal accessibility in view of a better and sustainable connectivity among urban, rural and coastal areas, increasing the offer of cross-border public transport services (land, sea) in favor of residents, commuters, students and tourists*) and SO 4.6 (e.g. *contributing to the implementation of macro-regional connections designing / planning /realizing sections of the ADRION-CYCLETOUR strategic project*). Although we do not reasonably expect projects co-funded from the IP to contribute greatly to reduction of GHG emissions or increase in the use of renewable energy, its investments into improved knowledge and skills of people and seized innovation potentials in economy of the programme area could on the long term cumulatively contribute to such results. The SEA team identified potential for further enhancement of already positive impact of the IP on the programme area by supporting projects aiming at embedding climate change mitigation and adaptation into existing business and core corporate decision-making processes.

At the same time we can report that a similar enhancement measure - linked to *"investigating potential and innovative technologies for carbon capture, utilisation or storage"* - has already been integrated into IP (in SO 2.6).

On the other hand, one negative impact of the IP on *"climate"* was also identified. It is linked to increased overall pressures to the environment due to increased and dispersed tourism flows – in this case especially increased traffic and energy consumption. It is true that the IP already plans to ensure implementation of sustainable and innovative practices in tourism, as well as through the ADRIONCYCLETOUR, POSEIDONE and the strategic

project for the joint management and sustainable development of the Classical Karst Area– thus, in part reducing the exposed negative impact to the non-significant level. However, due to already existing high pressures from tourism and transport sectors in the programme area, such cumulative negative impact cannot be simply disregarded.

This is why the SEA team recommends encouraging the project applicants to deploy "sustainability-by-design" approach that considers whether and how their proposed actions take into the consideration potential increase of tourist flows, improvement of the sustainability of their tourism offer and/or contribute to reduction of carbon footprint of their tourism products/services – as an IP mitigation measure.

None of exposed impacts have the character of synergic impacts. On the other hand, both recognized significant positive impacts can be considered as transboundary impacts – for two main reasons:

- Due to actions aimed at adaptation to climate change and mitigation of its effects, which could impact environmental elements (e.g. surface water bodies, large forested areas, etc.) extending beyond the programme area.
- Due to improved sustainable multimodal accessibility in view of a better and sustainable connectivity among urban, rural and coastal areas and improved cycling/hiking infrastructure, increasing the use of sustainable transport options (for daily use and tourism purposes) within and beyond the programme area and resulting in reduced pollution and decreased pressures.

Based on above provided assessment, we can conclude that the IP will have no significant direct, indirect, cumulative, synergic or transboundary negative impacts on the environmental aspect *"Climate".* However, the IP is expected to have many significant and non-significant positive impacts and one specific non-significant negative impact. The occurrence of all depends greatly on types of projects to be actually supported by the IP, as well as on the amount of funds actually allocated to individual projects.

Since there are no significant direct, indirect, cumulative, synergic or transboundary negative impacts on the environmental aspect *"Climate"*, no additional alternatives are proposed. Nonetheless, the SEA team provides the following mitigation measure to address the exposed non-significant negative impact:

- The IP should encourage all applicants applying to 4.6 to use *"environmental sustainability by design"* approach through the project selection process. Applicants should explain whether and how their proposed actions take into the consideration potential increase of tourist flows, improvement of the sustainability of their tourism offer and/or contribute to reduction of carbon footprint of their tourism products/services (e.g. new tourism products/services based on sustainable mobility solutions and/or public transport, systemic efforts to reduce or optimize tourism flows, etc.) – for example in the dedicated section of the project application templates. Subsequently, the IP should prefer to co-finance projects with sustainable solutions integrated in project design.

Furthermore, the SEA team identified the following enhancement measure, which could further enhance recognized positive impacts on the environmental aspect *"Climate"*:

- The following action could be added to SO 2.6 (or any other SO, if considered a better fit form the IP programming team) as an IP enhancement measure:
  "Promoting business networks embedding climate change mitigation and adaptation (along with other relevant environmental factors) into existing business operations and core corporate decision-making processes (e.g. product development, etc.).

With respect to DNSH, the absence of significant negative impacts on any manifestation of the *Climate* issue ensures the complying of the principle. As a matter of facts, the only signalled negative impact is related to potential tourism pressure coming from SO 4.6, so that the proposed mitigation measure (encouraging all applicants applying to 4.6 to use *"environmental sustainability by design"* approach) is applicable and sufficient to comply with the DNSH principle.

6.3 Water

The assessment is based on Priorities (PO), Specific Objectives (SO), Actions (A) and their relating exemplary actions – all in detail presented in chapter *"1. Overview of draft Programme".* It considers the following environmental issues established through the review of the relevant environmental objectives in chapter 4:

- Protection of surface water against pollution, harmful substances and hydro-morphological pressures
- Protection of groundwater against pollution and harmful substances
- Sustainable use of surface water and groundwater;

Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Objectives	Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Actions	Benefits & risks			Explanation
		+	-	TB	
SO 1.1 - Developing and enhancing research and innovation capacities and the uptake of advanced technologies	Promoting a cross-border ecosystem for R&D and strengthening the innovation capacities of local actors	0	0	0	Water is a relevant element for the Programme area for both surface and groundwater (see Section 5.3). It is considered particularly in SOs 2.4, 2.6 and 2.7, i.e. in the specific objectives dealing with the main environmental issues (climate change and resilience, transition to a resource efficient economy, nature protection). The exemplary actions with a probable impact on the issue of water are: the ones related to the implementation of circular economy (SO 2.6), with the reduction in the use and waste of water and other resources (e.g. *"Innovative and sustainable solutions for the conversion of production activities from a linear model towards a circular economy model, …"*; "*Develo-ping and testing innovative technologies following the concepts of industrial symbiosis and facilitating waste reuse, …*"); the ones related to environmental protection (SO 2.7), e.g. *"Promoting green and blue infrastructures …"*, and *"Preserving and restoring the natural capital of the cross-border area (…)* in order to limit the anthropogenic pressure also linked to tourism, …". In this sense, the cumulative impact of the IP on this en-
SO 2.4 - Promoting climate change adaptation and disaster risk prevention, and resilience, taking into account ecosystem based approaches	Fostering resilience capacity to climate change and mitigating risks related to natural disasters	+1	-1	0	
SO 2.6 - Promoting the transition to a circular and resource efficient economy	Developing shared model/solutions for the circular economy	+1	0	0	

SO 2.7 - Enhancing protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution	Conservation, protection, promotion of the cross-border area natural capital	+1	0	T+
SO 4.6 - Enhancing the role of culture and sustainable tourism in economic development, social inclusion and social innovation	Preservation, maintenance and promotion of the cultural heritage, implementation of sustainable and innovative practices in tourism, support to education and training to foster employability and social inclusion	+1	-1	0
ISO 1.(b) - Enhance efficient public administration by promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular, with a view to resolving legal and other obstacles in border regions	Increasing governance capacity to optimize services for citizens	0	0	0
ISO 1.(c) - Build up mutual trust, in particular by encouraging people-to-people actions	Supporting small-scale projects through people-to-people cross-border initiatives	0	0	0

vironmental aspect is expected to be positive, but non-significant, due to the absence of a direct addressing on it by the SOs and the exemplary actions. The purpose of improving the impacts on water will certainly be pursued by actions aimed to reduce the use of water as an input and as a recipient in industrial processes on one hand, and by projects recovering and protecting the ecological conditions of water bodies and systems on the other. Nonetheless, potential negative impacts on water quality and flows could come from tourism activities. They can suffer from increased and dispersed flows consequent to cultural and tourism valorisation, albeit the IP pays a strong attention to sustainable practices (e.g. *"Developing integrated tourism products based on the natural and cultural resources").* Being a so sensitive element, impacts on the water resource can arise as a collateral effect of projects aimed to reduce environmental problems otherwise, such as the construction of the cycling infrastructure for sustainable tourism *(e.g. "Contribute to the implementation of macro-regional connections designing / planning /realizing sections of the ADRIONCYCLETOUR cycle route operation of strategic importance"*).

Although it is planned as a measure to promote sustainable mobility and will be (due to limited financing ability of the IP) focused primarily on improving connectivity between already existing cycling routes, it could still have negative non-significant impacts on specific intersections with surface waters.

On the other hand, the POSEIDONE operation *of strategic importance* is aimed to the conservation and implementation of blue infrastructures, the reduction of impacts for both agriculture and aquaculture activities, and the conservation of marine biodiversity.

All such projects must comply with national environmental and spatial legislation, as well as obtain all mandatory permits prior to applying for co-financing from the IP. This means that they have to be planned through appropriate spatial planning documents for which separate SEAs have to be prepared and their environmental impact

checked on a lower planning level. Subsequently, we exclude such infrastructure-linked projects from this assessment, meaning that they will have to prove acceptability of their impacts on environment and obtain all permits prior to application for co-funding from the IP. Nonetheless, minor and localized, direct non-significant negative impacts on *"water"* of those co-funded projects containing such infrastructure activities can be expected.

This is why the SEA team recommends to encourage the project applicants to deploy "sustainability-by-design" approach that considers whether and how their proposed actions take into the consideration potential increase of tourist flows and possible impacts on water – as an IP mitigation measure.

None of exposed impacts have a synergic character, but for all actions linked to SO 2.7, dealing with improvement and conservation of natural capital (coastal and marine habitat included), we consider a positive transboundary impact, being surface water a non-stationary environmental asset.

Based on above provided assessment, we can conclude that the IP will have no significant direct, indirect, cumulative, synergic or transboundary negative impacts on the environmental aspect *"Water".* However, the IP is expected to have some non-significant but positive impacts. The occurrence of them depends greatly on types of projects to be supported, as well as on the amount of funds allocated to individual projects. Due to the scale and type of projects supported in the previous programming periods, as well as the fact that all project must be developed and implemented in line with the existing legislative framework, we cannot realistically expect any significant impacts.

Since there are no significant direct, indirect, cumulative, synergic or transboundary negative impacts on the environmental aspect *"Water"*, no additional alternatives are suggested. Nonetheless, the SEA team identified the following mitigation measures to offset the identified non-significant negative impact:

- for tourism projects (including the three strategic projects POSEIDONE, ADRIONCYCLETOUR and the strategic project for the joint management and sustainable development of the Classical Karst Area), consider the potential impact on water quality through *"environmental sustainability by design"* approach: applicants should explain whether and how their proposed actions take into the consideration potential increase of tourist flows and the related impact on the water resource, for example in the dedicated section of the project's application template. Subsequently, the IP should prefer to co-finance projects with sustainable solutions integrated in project design;
- for the ADRIONCYCLETOUR strategic project, the study of the construction's impact on the local water system has to be considered in a dedicated section of the project's application template.

With respect to DNSH, the absence of significant negative impacts on any manifestation of the *Water* issue ensures the complying of the principle.

Nonetheless, three potential moderate negative impacts have been signalled: the first one, coming from small infrastructure for risk prevention (SO 2.4), does not deserve any further mitigation measure; this is not the case for the other two, namely sustainable mobility projects such as ADRIONCYCLETOUR cycle route and potential pressures form increased tourism attendance (SO 4.6). The proposed mitigation measure (encouraging all applicants applying to 4.6 to use *"environmental sustainability by design"* approach, and a dedicated explanation of construction's impact on the local water system for ADRIONCYCLETOUR) are confirmed to comply with the DNSH principle.

6.4 Soil and land use

The assessment is based on Priorities (PO), Specific Objectives (SO), Actions (A) and their relating exemplary actions – all in detail presented in chapter *"1. Overview of draft Programme"*. The assessment considered the following environmental issues established through the review of the relevant environmental objectives in chapter 4:

- Ensuring sustainable use of land and soil;
- Preventing loss of soil and soil pollution.

Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Objectives	Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Actions	Benefits & risks			Explanation
		+	-	TB	
SO 1.1 - Developing and enhancing research and innovation capacities and the uptake of advanced technologies	Promoting a cross-border ecosystem for R&D and strengthening the innovation capacities of local actors	+1	0	0	Although *"soil"* as a natural resource is not directly targeted by the IP, we can state that the IP has predominantly positive impacts – both on ensuring sustainable use of land and soil, as well as on prevention of soil loss and soil pollution. We expect positive impacts of the IP on *"soil and land use"*, as listed in the introduction table to this chapter, to occur. However, listed positive impacts do not reach the level of a significant positive impact and gain on their importance only on a cumulative level. From the *"soil and land use"* point of view, we must expose spatial planning as an important sustainable development policy implementation tool, with significant impact on sustainable use of land and subsequently preservation of soil as a natural resource. It is most effective when spatial planning solutions are combined with examples of its implementation through *"transfer of best practices"* processes. Despite the efforts from the IP to invest in improved governance and transfer of best practices, the importance of spatial planning as a key tool of circular economy, green and blue infrastructure or climate change adaptation concepts are quite weak.
SO 2.4 - Promoting climate change adaptation and disaster risk prevention, and resilience, taking into account ecosystem based approaches	Fostering resilience capacity to climate change and mitigating risks related to natural disasters	+1	-1	0	
SO 2.6 - Promoting the transition to a circular and resource efficient economy	Developing shared model/solutions for the circular economy	+1	0	0	

SO 2.7 - Enhancing protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution	Conservation, protection, promotion of the cross-border area natural capital	+1	0	0
SO 4.6 - Enhancing the role of culture and sustainable tourism in economic development, social inclusion and social innovation	Preservation, maintenance and promotion of the cultural heritage, implementation of sustainable and innovative practices in tourism, support to education and training to foster employability and social inclusion	0	-1	0
ISO 1.(b) - Enhance efficient public administration by promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular, with a view to resolving legal and other obstacles in border regions	Increasing governance capacity to optimize services for citizens	0	0	0
ISO 1.(c) - Build up mutual trust, in particular by encouraging people-to-people actions	Supporting small-scale projects through people-to-people cross-border initiatives	0	0	0

This is why the SEA team already in previous programming steps proposed the recognition of *"sustainable spatial planning"* as a key topic for knowledge sharing and transfer of best practices as an IP enhancement measure. At this point we can conclude that IP already incorporated this enhancement measure in SO 2.7.

On the other hand, two negative impacts of the IP on *"soil and land use"* were also identified. The first one is linked to potential soil loss and sealing due to small-scale infrastructure investments, as well as cycling infrastructure investments supported by the IP – especially linked to SO 2.4 and 4.6 supported actions like *"small infrastructures for risk prevention and management"*, *"cycling infrastructure"*or other similar activities planned within the three IP supported strategic projects. Although such activities are planned as a climate change adaptation measure or a measure to promote sustainable mobility/tourism (at this point actual locations are not known), they could still have negative non-significant impacts on soil loss and sealing.

However, all such projects must comply with national environmental and spatial legislation, as well as obtain all mandatory permits prior to applying for co-financing from the IP. This means that they have to be planned through appropriate spatial planning documents for which separate SEAs have to be prepared and their environmental impact checked on a lower planning level. Subsequently, we exclude such infrastructure-linked projects from this assessment, meaning that they will have to prove acceptability of their impacts on environment and obtain all permits prior to application for co-funding from the IP. Nonetheless, minor and localized, direct non-significant negative impacts on *"soil and land use"* of those co-funded projects containing small-scale infrastructure activities can be expected.

The second one is linked to increased overall pressures to the environment due to increased and dispersed tourism flows – in this case soil sealing, change of land use and increased waste production can be pointed out. IP implementation enhanced tourism flows can also be

	linked to some indirect negative impacts, which will have cumulative impacts with other existing and planned pressures in the programme area (e.g. various types of pollution, increased need for resources, etc.) - leading towards challenges connected to insufficient infrastructure, poorer state of environment. To mitigate the impacts of these challenges additional infrastructure (e.g., for accessibility) has to be built to manage a larger number of visitors, leading back to additional soil loss and sealing - already discussed above. However, the IP already plans to ensure implementation of sustainable practices in tourism – thus, in part reducing the exposed negative impact. Due to both exposed negative impacts, as well as existing high pressures on *"soil and land use"* in the programme area, the SEA team recommends to encourage the project applicants to deploy *"sustainability-by-design"* approach that considers whether and how their proposed actions take into the consideration effective use of natural resources – as an IP mitigation measure. As all stated impacts can be considered to be direct/indirect impacts, linked to a specific area of project or intervention, none of exposed impacts have the character of synergic or transboundary impacts.

Based on above provided assessment, we can conclude that the IP will have no significant direct, indirect, cumulative, synergic or transboundary negative impacts on the environmental aspect *"Soil and land use".* However, the IP is expected to have many non-significant positive impacts and some non-significant negative impacts. The occurrence of both depends greatly on types of projects to be supported, as well as on the actual amount of funds allocated to individual projects.

Since there are no significant direct, indirect, cumulative, synergic or transboundary negative impacts on the environmental aspect *"Soil and land use"*, no additional alternatives are proposed. Nonetheless, the SEA team provides the following mitigation measure to address exposed non-significant negative impacts:

- The IP should encourage all applicants to use *"environmental sustainability by design"* approach through the project selection process. Applicants should explain whether and how their proposed actions take into the consideration effective and sustainable use of natural re-sources and/or contribute to regeneration of the environment and ecosystem services (e.g. in the dedicated section of the project application templates). Additionally, all project applications relating to infrastructure interventions, should take into account soil sealing and build proposed mitigation measures into the project design. Subsequently, the IP should prefer to co-finance projects with sustainable solutions integrated in project design.

With respect to DNSH, the absence of significant negative impacts on any manifestation of the *Soil use* issue ensures the complying of the principle, involved in terms of soil pollution (see Table 2.7). Nonetheless, three potential moderate negative impacts have been signalled, namely the small infrastructure for risk prevention (SO 2.4), the sustainable mobility projects such as ADRIONCYCLETOUR cycle route, and the potential pressures form increased tourism attendance (SO 4.6). For all of them, the proposed mitigation measure (encouraging all applicants to 4.6 to use *"environmental sustainability by design"* approach) is confirmed to comply with the DNSH principle.

6.5 Biodiversity and natural heritage

The assessment considered the following environmental issues established through the review of the relevant environmental objectives in chapter 5:

- Favourable condition for species and habitats of European interest;
- Protection and promotion of the geological heritage;
- Development of nature protection areas.

Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Objectives	Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Actions	Benefits & risks			Explanation
		+	-	TB	
SO 1.1 - Developing and enhancing research and innovation capacities and the uptake of advanced technologies	Promoting a cross-border ecosystem for R&D and strengthening the innovation capacities of local actors	0	0	0	Biodiversity, geodiversity and the Natura 2000 network are fundamen-tal assets of the programme area for both wellbeing and sustainable development of local communities. Besides of transversal to all POs considered by the IP, they are the target of the PO no. 2, specifically of SO 2.7 "Enhancing protection and preservation of nature, biodiversity, and green infrastructure, including in urban areas, and reducing all forms of pollution". All the exemplary actions introduced by the IP for this SO could have a positive and significant impact on biodiversity. As anticipated, besides of SO 2.7, even SO 2.4 and SO 2.6 could have positive impacts on biodiversity related respectively to "Promoting active awareness of risks due to anthropogenic changes and related climate changes on local ecosystems (…)", and to "Supporting projects relating to ecosystem services and water management" exemplary actions. Furthermore, a tangible positive impact on biodiversity could come from the implementation of the strategic project for the joint management and sustainable development of the Classical Karst Area (SO 4.6.), valorising geo
SO 2.4 - Promoting climate change adaptation and disaster risk prevention, and resilience, taking into account ecosystem based approaches	Fostering resilience capacity to climate change and mitigating risks related to natural disasters	+1	-1	0	
SO 2.6 - Promoting the transition to a circular and resource efficient economy	Developing shared model/solutions for the circular economy	+1	0	0	

SO 2.7 - Enhancing protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution	Conservation, protection, promotion of the cross-border area natural capital	+2	0	0
SO 4.6 - Enhancing the role of culture and sustainable tourism in economic development, social inclusion and social innovation	Preservation, maintenance and promotion of the cultural heritage, implementation of sustainable and innovative practices in tourism, support to education and training to foster employability and social inclusion	+2	-1	0
ISO 1.(b) - Enhance efficient public administration by promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular, with a view to resolving legal and other obstacles in border regions	Increasing governance capacity to optimize services for citizens	0	0	0
ISO 1.(c) - Build up mutual trust, in particular by encouraging people-to-people actions	Supporting small-scale projects through people-to-people cross-border initiatives	0	0	0

diversity, and the other two exemplary actions of “Developing integrated tourism products based on the natural and cultural resources of the area (…)”and “Contribute to the implementation of macro- regional connections (…) of the ADRIONCYCLETOUR cycle route”, the latter capable to emphasise the good state of nature. The significant positive impact could be expected also by implementation of strategic project POSEIDON (SO 2.7) focusing more on marine and coastal biodiversity, sustainable fisheries, conservation and implementation of green and blue infrastructure. As well as services for the enhancement and protection of biodiversity.

Consequently, the cumulative impact of the IP on this environmental aspect is significantly positive, with a set of objectives and actions specifically destined to the protection of the ecosystem and the natural capital.

Finally, due to the relevance of PO2 in the programme, SOs and actions dealing with biodiversity, geodiversity, green and blue infrastructure and protected areas management have a positive synergic impact on the area: a higher environmental protection represents a pre-condition to a boost-in sustainable tourism, but nature conservation has a positive impact even on climate and can take advantage of circular economy aspects.

Albeit not significant, potential negative impacts on biodiversity could be expected due to potentially increased tourist flows in protected areas, and to the construction of infrastructures for sustainable mobility and of small infrastructures for risk prevention. They ought to be considered and be the object of mitigation measures. In addition, it must be recalled that each project with an impact on a Natura 2000 site will necessarily provide an appropriate assessment procedure, as remarked in the IP Appropriate Assessment (see Annex).

Thanks to the place-based nature of the specific environmental object, the considered actions spread their effects within the programme area, with no actual transboundary dimension.

Based on above assessment, we can conclude that the IP will have a significant direct, cumulative and synergic positive impacts on the environmental aspect *"Biodiversity and natural heritage".* The occurrence of them depends greatly on types of projects to be supported, as well as on the amount of funds allocated to individual projects. Due to the "non-investment" character of the IP, the scale and type of projects supported in the previous programming periods, as well as the fact that all project must be developed and implemented in line with the existing legislative framework, we can expect no significant negative impact, but positive impacts in terms of immaterial support, managing solutions and further reduction of risky activities for biodiversity.

Since there are no significant direct, indirect, cumulative, synergic or transboundary negative impacts on the environmental aspect *"Biodiversity and natural heritage"*, and remembering that each project with potential impacts involving Natura 2000 sites requires an Appropriate Assessment procedure, no additional proposals of alternatives are suggested. Nonetheless, the SEA team identified the following mitigation measures:

- for the projects related to the tourism, the IP should encourage all applicants to use *"environmental sustainability by design"* approach through the project selection process. Applicants should explain whether and how their proposed actions take into the consideration effective and sustainable use of natural re-sources and/or contribute to regeneration of the environment and ecosystem services (e.g. in the dedicated section of the project application templates). Subsequently, the IP should prefer to co-finance projects with sustainable solutions integrated in project design.

With respect to DNSH, the absence of significant negative impacts on any manifestation of the *Biodiversity* issue ensures the complying of the principle. Nonetheless, three potential non-significant negative impacts have been signalled, namely the small infrastructure for risk prevention (SO 2.4), the sustainable mobility projects such as ADRIONCYCLETOUR cycle route, and the potential pressures from increased tourist flows in protected areas (SO 4.6). For all of them, the proposed mitigation measure (encouraging all applicants to 4.6 to use *"environmental sustainability by design"* approach) is confirmed to comply with the DNSH principle. Furthermore, the potential impact of proposed projects on sensitive habitats of Natura 2000 network would claim for an appropriate assessment procedure (see Annex).

6.6 Landscape and Cultural heritage

The assessment considered the following environmental issues established due to the review of the relevant environmental objectives in chapter 4:

- Risk of agricultural land abandonment
- Landscape fragmentation
- Reduction of tangible and intangible cultural heritage

Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Objectives	Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Actions	Benefits & risks			Explanation
		+	-	TB	
SO 1.1 - Developing and enhancing research and innovation capacities and the uptake of advanced technologies	Promoting a cross-border ecosystem for R&D and strengthening the innovation capacities of local actors	0	0	0	Landscape and cultural heritage is a quite mixed environmental issue, merging together aspects related to the nature assets, the use of the soil and the historic and tradition heritage of the local communities. The object is mostly impacted in SO 4.6, addressed to the valorisation of the cultural assets of the programme area, and in SO 2.7, due to the existing relationship between landscape quality and nature conservation, while non-significant positive impacts are visible in SOs 2.4 and 2.6. The Specific Objectives find a potential positive implementation in the exemplary actions *"Promoting active awareness of risks due to anthropogenic changes and related climate changes on local ecosystems (…)"* (SO 2.4), and *"Supporting projects relating to ecosystem services (e.g., pro biodiversity business) and water management"* (SO 2.6). They to show stronger connections to actions such as*: "Promoting, applying through pilot actions, capitalising joint strategies for the conservation and protection of biodiversity and geodiversity (…)";Preserving and restoring "of the cross-border area (…)";"Promoting sustainable spatial planning, (…) and ensure sustainable land use and landscape management"; "Implementation of the strategic project dedicated to the protection and promotion of coastal and maritime area"* (SO 2.7); *"Preservation, revitalisation, maintenance and promotion of com-*
SO 2.4 - Promoting climate change adaptation and disaster risk prevention, and resilience, taking into account ecosystem based approaches	Fostering resilience capacity to climate change and mitigating risks related to natural disasters	+1	-1	0	
SO 2.6 - Promoting the transition to a circular and resource efficient economy	Developing shared model/solutions for the circular economy	+1	0	0	
SO 2.7 - Enhancing protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution	Conservation, protection, promotion of the cross-border area natural capital	+2	0	0	

SO 4.6 - Enhancing the role of culture and sustainable tourism in economic development, social inclusion and social innovation	Preservation, maintenance and promotion of the cultural heritage, implementation of sustainable and innovative practices in tourism, support to education and training to foster employability and social inclusion	+2	-1	0
ISO 1.(b) - Enhance efficient public administration by promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular, with a view to resolving legal and other obstacles in border regions	Increasing governance capacity to optimize services for citizens	0	0	0
ISO 1.(c) - Build up mutual trust, in particular by encouraging people-to-people actions	Supporting small-scale projects through people-to-people cross-border initiatives	+1	0	0

mon tangible and intangible cultural heritage (…)"; "Implementation of the strategic project (…)of the Geopark Karst"; "Developing integrated tourism products based on the natural and cultural resources of the area (…)"; "Contribute to the implementation of macro-regional connections (…) of the ADRIONCYCLETOUR cycle route flagship" (SO 4.6).

A negative although non-significant impact has been associated to the identification of mobility infrastructures as a main source for landscape fragmentation (see Section 5.6.1) and as a flagship project in the IP (ADRIONCYCLETOUR); the same happens with respect to small infrastructures for risk management (SO 2.4). Finally, a source of potential negative impacts on landscape is increased tourism (SO 4.6).

These issues must be considered for IP mitigation measures, suggesting to project applicants to deploy"sustainability-by-design" approach, and considering whether and how their proposed actions take into the consideration potential increase of tourist flows and possible impacts on landscape.

Albeit the recalled connections with other parts of the IP and other environmental issues, no synergic impact has been identified. In the same way, no transboundary assessment can be recognized.

Based on above provided assessment, we can conclude that the IP will have no significant direct, indirect, cumulative, synergic or transboundary negative impacts on the environmental aspect *"Landscape and Cultural heritage".* However, the IP is expected to have significant positive impacts on cultural heritage and landscape. Furthermore, a warning is raised on the potential impact of mobility actions on landscape fragmentation: dealing with sustainable mobility, it is improbable they could have a non-significant negative impact, but the issue asks for attention, mostly when involved an infrastructure at the European level such as the ADRIONCYCLETOUR pathway.

The occurrence of them depends greatly on types of projects to be supported, as well as on the actual amount of funds allocated to individual projects. Due to the scale and type of projects supported in the previous programming periods, as well as the fact that all project must be developed and implemented in line with the existing legislative framework, we cannot realistically expect any significant impacts.

Since there are no significant direct, indirect, cumulative, synergic or transboundary negative impacts on the environmental aspect *"Landscape and Cultural heritage"*, no additional proposals of alternatives are suggested. Nonetheless, the SEA team identified the following mitigation measure:

- for projects relating to tourism the IP should encourage all applicants to use *"environmental sustainability by design"* approach through the project selection process. Applicants should explain whether and how their proposed actions take into the consideration effective and sustainable use of natural resources and contribute to regeneration of the environment and ecosystem services (e.g. in the dedicated section of the project application templates); the issue of landscape fragmentation should be particularly addressed. Subsequently, the IP should prefer to co-finance projects with sustainable solutions integrated in project design.

6.7 Population and human health

The assessment is based on Priorities (PO), Specific Objectives (SO), Intervention fields and actions, and their relating exemplary actions – all in detail presented in chapter "1. Overview of draft Programme". The assessment considered the following environmental issues established through the review of the relevant environmental objectives in chapter 4:

- Reduce the population share exposed to excessive air pollution
- Reduce the population share exposed to excessive noise levels
- Reduction and efficient recycling of waste
- Promotion of recycling and the circular economy
- Improve the public health, well-being and overall quality of life
- Reduce the population share exposed to flood risk

Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Objectives	Interreg VI-A Italy-Slovenia 2021-2027 Programme Specific Actions	Benefits & risks			Explanation
		+	-	TB	
SO 1.1 - Developing and enhancing research and innovation capacities and the uptake of advanced technologies	Promoting a cross-border ecosystem for R&D and strengthening the innovation capacities of local actors	+1	0	0	The IP in general could have positive impact on environmental and public health, well-being and overall quality of life. Actions under SO 1.1 and SO 4.6 could contribute to better quality of life through new employment opportunities, especially in post-pandemic period, through actions that will contribute to enlargement of business networks between local actors and the biggest innovation players and to development of entrepreneurial skills that can help the creation of start-ups and business models of young people (SO 1.1); as well as actions aiming to foster employability in tourism and social inclusion (SO 4.6). In addition to that, significant contribution to better and healthier life could be expected from SOs 2.4 and 2.7 from different point of view. In general, actions under these SOs could result in reduced air and noise pollution, and decreased exposure to climate change risk such flood, thus delivering improved environmental health and substantially contributing to improved public health. Climate change is an important driver of destabilization in our environment, not only due to climate change interlinked weather extremes and hazards, but also due to overall decreased resilience of environment, economy and society.
SO 2.4 - Promoting climate change adaptation and disaster risk prevention, and resilience, taking into account ecosystem based approaches	Fostering resilience capacity to climate change and mitigating risks related to natural disasters	+2	0	T+	
SO 2.6 - Promoting the transition to a circular and resource efficient economy	Developing shared model/solutions for the circular economy	+1	0	0	

SO 2.7 - Enhancing protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution	Conservation, protection, promotion of the cross-border area natural capital	+2	0	0
SO 4.6 - Enhancing the role of culture and sustainable tourism in economic development, social inclusion and social innovation	Preservation, maintenance and promotion of the cultural heritage, implementation of sustainable and innovative practices in tourism, support to education and training to foster employability and social inclusion	+2	-1	0
ISO 1.(b) - Enhance efficient public administration by promoting legal and administrative cooperation and cooperation between citizens, civil society actors and institutions, in particular, with a view to resolving legal and other obstacles in border regions	Increasing governance capacity to optimize services for citizens	+1	0	T+
ISO 1.(c) - Build up mutual trust, in particular by encouraging people-to-people actions	Supporting small-scale projects through people-to-people cross-border initiatives	+1	0	0

By aiming at improved resilience to climate change (SO 2.4), IP will significantly positively impact and actively support climate change stabilization efforts.

Improved quality of life and well-being could be expected also from ISO 1b and ISO 1c by strengthening public administration and involving local actors in the design and realisation of multisector interventions for integrated local development and sustainable mobility.

This will allow to efficiently address local challenges by acting and creating solutions locally, by capitalising actors' expertise and stimulating their commitment.

The SO 4.6 could have significant positive impact due to potential business and employment opportunities in tourism sector. On the other hand, potential indirect adverse impact could be expected due to increased traffic and consequently air and noise pollution in touristic areas where high pressures from tourism and transport sectors already exists, although the support to sustainable tourism through ADRIONCYCLETOUR should compensate.

Therefore, we suggest the same measures as suggested for the environmental topic "Air". The implementation of all three strategic projects (ADRIONCYCLETOUR (SO 4.6), the strategic project for the joint management and sustainable development of the Classical Karst Area (SO 4.6.) and POSEIDON (SO 2.7)) have a great potential to improve public health, wellbeing and overall quality of life. While ADRIONCYCLETOUR and the strategic project for the joint management and sustainable development of the Classical Karst Area will have positive impact by providing more opportunities for "healthier" recreation activities and employments in tourism, the POSEIDON project aims to improvement of environmental conditions of green/blue areas (including improvement of quality of water and beaches).

None of exposed impacts have the character of synergic impacts. Transboundary impact could be expected for SO 2.4 and mobility (ISO 1.(b)). In case of SO 2.4, any ac-

	tions aimed at adaptation to climate change and mitigation of its effects, could impact environmental elements (e.g. surface water bodies, large forested areas, etc.) extending beyond the programme area. Similarly, in case of ISO 1.(b)., improved sustainable multimodal mobility and its infrastructure could increase the use of sustainable transport options within and beyond the programme area.

Based on above provided assessment, we can conclude that the IP will have no significant direct, indirect, cumulative, synergic or transboundary adverse impacts on the environmental aspect *"Population and health".* However, the IP in general is expected to have significant and non-significant positive impacts on environmental and public health, well-being and overall quality of life of people living in the programming area. The occurrence of both depends greatly on types of projects to be supported. Significant positive impact on population and human health is expected through the implementation of all three strategic projects: ADRIONCYCLETOUR (SO 4.6), the strategic project for the joint management and sustainable development of the Classical Karst Area (SO 4.6.) and POSEIDON (SO 2.7).

The SEA Team do not suggest any additional mitigation and/or enhancement measures than those that are already suggested for other environmental aspects, especially the ones for environmental aspects "Air" and "Climate change".

With respect to DNSH, the absence of significant negative impacts on any manifestation of the *Human health* ensures the complying of the principle, involved in terms of air pollution and waste prevention and recycling (see Table 2.7). The only signalled not significant adverse impact is due to the potential pressures form increased tourism attendance (SO 4.6), so that the mitigation measure proposed are the ones considered for Air and Climate change, i.e. encouraging all applicants to 4.6 to use *"environmental sustainability by design"* approach. This measure is confirmed even to comply with the DNSH principle.

6.8. Conclusion on the impact of the Interreg Italy-Slovenia 2021-2027 Programme on environment

Based on all above findings, the conclusion of this Environmental Report is that impacts of the implementation the Interreg Italy-Slovenia 2021-2027 Programme on environment will be predominantly positive, while identified non-significant negative impacts can be mitigated by proposed mitigation measures (presented in the next chapter) directly targeting implementing IP procedures.

7. Proposed mitigation and enhancement measures

This chapter describes measures proposed to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the programming document (as per the SEA Directive requirement Annex 1, item g).

While the mitigation measures are proposed to be integrated into the IP, the enhancement measures and recommendations are conceived mainly as suggestions which the IP programming team and the MA/JS may - or may not – eventually accept.

Proposed mitigation measures	Targeted SO / *Environmental aspects*	Argumentation, feasibility and timeframe for execution of the measure
The IP should encourage all applicants applying to 4.6 to use "environmental sustainability by design" approach through the project selection process. Applicants should explain whether and how their proposed actions take into the consideration potential increase of tourist flows, i**m**provement of the sustainability of their tourism offer and/or contribute to reduction of carbon footprint of their tourism products/services (e.g. new tourism products/services based on sustainable mobility solutions and/or public transport, systemic efforts to reduce or optimize tourism flows, etc.)**, as well as effective and sustainable use of natural resources and/or contribute to regeneration of the environment and ecosystem services** – for example in the dedicated section of the project application templates. Subsequently, the IP should prefer to co-finance projects with sustainable solutions integrated in project design.	2.4 4.6 *Air, Climate, Water, Soil, Biodiversity and Natural heritage,* Landscape and Cultural heritage, *Population and human health*	Mitigation measure is reasonable, as it improves sustainability of IP supported projects and enables exposed non-significant negative impacts to be avoided or mitigated. Mitigation measure is feasible, as it can be integrated into the tender project documentation (e.g. minimum requirements, project application templates, project assessment, etc.) and enforced through the project selection process. It can also be adequately promoted during IP promotion events. Mitigation measure should be implemented throughout IP implementation period.
Consider and assess the impact of ADRIONCYCLETOUR infrastructure on the local water system.	4.6 *Water*	Mitigation measure is reasonable, as it improves sustainability of the strategic project and enables exposed non-significant negative impacts to be avoided or mitigated. Mitigation measure is feasible, as it can be integrated into the tender project documentation (e.g. minimum requirements, project application templates, project assessment, etc.) and enforced through the strategic project approval process. Mitigation measure should be implemented during the strategic project approval process.

Proposed enhancement measures and recommendations	Targeted SO / E*nvironmental aspects*	Argumentation, feasibility and timeframe for execution of the measure
The IP should encourage the applicants to consider potential linkages between actions within ISO 1b (non-urban multimodal transport) and SO 4.6 (ADRIONCYCETOUR).	*Air* ISO 1b, 4.6	Proposed enhancement measure is reasonable, as it allows to take into account the "wider picture" of potential pressure from tourism and transport in wider area. Linking and syncing these actions could significantly contribute to improved traffic flows, decrease of traffic congestions and therefore improved air quality. This enhancement measure is feasible as it can be integrated into the tender project documentation (e.g. minimum requirements, project application templates, project assessment, etc.) and enforced through the project selection process. It can also be adequately promoted during IP promotion events. Enhancement measure should be implemented throughout IP implementation period.
The following action could be added to SO 2.6 (or any other SO, if considered a better fit form the IP programming team) as an IP enhancement measure: "Promoting business networks embedding climate change mitigation and adaptation (along with other relevant environmental factors) into existing business operations and core corporate decision-making processes (e.g. product development, etc.).	2.6 *Climate*	Proposed enhancement measure is reasonable, as it promotes considering climate change mitigation and adaptation already on the corporate decision making, instead of considering it only on the product/production cycle level. This enhancement measure is feasible as it would represent a new exemplary action within the existing context of SO2.6. Thus, it is our recommendation that it should be considered by the Programming Authority and could be integrated into the final IP version before its adoption.

8. Proposed monitoring

Article 10 of the SEA directive specifies that monitoring measures shall be prescribed in the context of an SEA, if significant negative impacts can be identified. Such monitoring measures shall allow to identify unforeseen adverse effects at an early stage and take mitigating action.

No significant negative impacts have been identified in the SEA for any of 7 SOs of the Interreg VI-A Italy-Slovenia 2021-2027 Programme, and only non-significant negative impacts have been identified for 2 out of 7 SOs. Furthermore, the whole IP is placing a strong emphasis on improving the environmental situation and addressing key environmental and sustainability concerns. For identified minor negative impacts mitigation measures were foreseen, as well as recommendations for further enhancement of identified positive impacts of the IP. Many of them were already addressed and integrated into the IP, as described in chapter 1.4. Those that remain are presented in chapter 7.

Subsequently, no mandatory monitoring measures are necessary to be implemented.

However, to measure the enhancement of the IP impact and to ensure coherence with assessments of the SEA we recommend monitoring measures that are linked to the most sensitive and mostly affected aspects. They are also designed with administrative burden in mind, thus allowing for an overview of potential developments for sensitive aspects, without placing a disproportionate burden on programme authorities or projects:

- Number of the studies of the carrying capacity of the protected areas, prepared as a part of supported projects.
- Number of visitor management plans in protected areas, prepared as a part of supported projects.
- Number of newly developed sustainable tourism products/services/activities, developed as a part of supported projects.
- Number of sustainable mobility/accessibility strategies targeting tourists as one of key target groups, developed as a part of supported projects.

We also recommend that the monitoring of possible environmental effects is ideally reflected throughout the project cycle as follows:

Project application and contracting phase:

- Consideration of possible environmental effects as a horizontal issue during the application phase (quality assessment and project selection);
- Involvement of external experts with the necessary environmental expertise for the quality assessment of project applications;
- Explanations and self-assessment of possible environmental effects in the application form (based on guiding questions);
- Obligation to comply with the relevant EU and national environmental legislation is embedded in the Subsidy Contract.

Project implementation phase:

- Monitoring of project progress and implementation at different stages of the project life cycle
- On-the-spot checks of project pilot investments conducted by the MA/JS including the compliance with environmental regulatory requirements (if required, involving also external experts).

Project closure phase:

- Reporting on environmental sustainability of the projects (if applicable, including the adherence to relevant EU and national environmental regulations).

If this recommendation is respected, the MA/JS will simultaneously be able to execute the proposed monitoring, collect values for all proposed indicators, as well as adequately implement proposed mitigation measures and recommendations.

9. Do No Significant Harm principle assessment

As reported in Section 2.5, the DNSH principle is aimed to ensure the coherence of supported activities with Article 17 of EU Regulation 852/2020, to avoid any potential impact on six categories of environmental objectives as defined by Article 9 of the same regulation. According to Italian guidelines, they are:

1. climate change mitigation; so that an activity significantly harms climate change mitigation whenever it generates significant emissions of GHG;
2. climate change adaptation; so that an activity significantly harms climate change adaptation whenever it leads to the worsening of negative effects on current and future climate, on people, nature or goods;
3. the sustainable use and protection of water and marine resources; so that an activity significantly harms water and marine resources whenever it worsens the conditions or the ecological potential of water bodies, surface and groundwater included, and of marine waters;
4. the transition to a circular economy; so that an activity significantly harms the transition to a circular economy, waste prevention and recycling included, whenever it leads to significant inefficiencies in the use of raw materials, in the direct and indirect use of natural resources, or of it implies a significant increase in generation, incineration and disposal of waste, or even if the long-run disposal of waste could cause a significant and long-run harm to environment;
5. pollution prevention and control; so that an activity significantly harms the pollution prevention and reduction whenever it implies a significant increase in the emission of pollutants in air, water or soil;
6. the protection and restoration of biodiversity and ecosystems; so that an activity significantly harms the protection and restoration of biodiversity and ecosystems whenever it damages significantly the good state and the resilience of ecosystems or to the conservation state of habitats and species, the ones of EU interest included.

Following the Italian national guidelines and considering the specific issues highlighted in the previous Section 6, the Table 9.1 gives back the total picture of the IP compliance to the DNSH principle assessment.

As requested by the mentioned guidelines, for each considered action (in this case, the SOs and Actions of the IP) it reports:

- in the first column (A) the percentage of compliance of the action with respect to the environmental objective;
- in the second (B), the detailed references to the ER parts reporting the analyses supporting the proposed assessment.
- in the “Summary of the results” raw the rationale, the assessment and the measures proposed to make it consistent whenever the column (A) does not report a 100% compliance;

SO	SO 1.1 Developing and enhancing research and innovation (…)		SO 2.4 Promoting climate change adaption and disaster risk prevention, and resilience, …		SO 2.6 Promoting the transition to a circular and resource efficient economy		SO 2.7 Enhancing protection and preservation of nature, biodiversity and green infrastru-cture (…)		SO 4.6 Enhancing the role of culture and sustainable tourism …		ISO 1.b Enhance efficient public administration by promoting legal and administrative coope-ration …		ISO 1.c Build up mutual trust, encouraging people-to-people actions	
Actions	**Promoting a cross-border ecosystem for R&D and strengthening the innovation capacities of local actors**		**Fostering resilience capacity to climate change and mitigating risks related to natural disasters**		**Developing shared model/ solutions for the circular economy**		**Conservation, protection, promotion of the cross-border area natural capital**		**Preservation, maintenance and promotion of the cultural heritage, implementation of sustainable and innovative practices in tourism …**		**Increasing governance capacity to optimize services for citizens**		**Supporting small-scale projects through people-to-people cross-border initiatives**	
DNSH Environmental Objectives	A	B	A	B	A	B	A	B	A	B	A	B	A	B
1.Climate - Mitigation	100%	§ 5.2	100%	§ 5.2	100%	§ 5.2	100%	§ 5.2	80%	§ 5.2	100%	§ 5.2	100%	§ 5.2
Summary of the results	The absence of significant negative impacts ensures the complying 100% of the DNSH principle. As a matter of facts, the only signalled negative impact is related to potential tourism pressure coming from SO 4.6, so that the proposed mitigation measure (encouraging all applicants applying to 4.6 to use *"environmental sustainability by design"* approach) is applicable and sufficient to comply with the DNSH principle.													
2. Climate - Adaption	100%	§ 5.2	100%	§ 5.2	100%	§ 5.2	100%	§ 5.2	80%	§ 5.2	100%	§ 5.2	100%	§ 5.2
Summary of the results	The absence of significant negative impacts ensures the complying 100% of the DNSH principle. As a matter of facts, the only signalled negative impact is related to potential tourism pressure coming from SO 4.6, so that the proposed mitigation measure (encouraging all applicants applying to 4.6 to use *"environmental sustainability by design"* approach) is applicable and sufficient to comply with the DNSH principle.													
3. Water	100%	§ 5.3	90%	§ 5.3	100%	§ 5.3	100%	§ 5.3	75%	§ 5.3	100%	§ 5.3	100%	§ 5.3
Summary of the results	The absence of significant negative impacts ensures the complying of the principle. Nonetheless, three potential moderate negative impacts have been signalled: the first one, coming from small infrastructure for risk prevention (SO 2.4), does not deserve any further mitigation measure; this is not the case for the other two, namely sustainable mobility projects such as ADRIONCYCLETOUR cycle route (SO 4.6), and potential pressures form increased tourism attendance (SO 4.6). For the last ones, the proposed mitigation measure (encouraging all applicants applying to 4.6 to use *"environmental sustainability by design"* approach, and a dedicated explanation of potential construction's impact on the local water system for ADRIONCYCLETOUR) are confirmed to comply with the DNSH principle.													
4. Circular economy	100%	§ 5.7.3	100%	§ 5.7.3	100%	§ 5.7.3	100%	§ 5.7.3	80%	§ 5.7.3	100%	§ 5.7.3	100%	§ 5.7.3
Summary of the results	The absence of significant negative impacts ensures the complying of the principle, involved in terms of waste prevention and recycling. The only signalled moderate negative impact is due to the potential pressures form increased tourism attendance (SO 4.6), so that the mitigation measure proposed (encouraging all applicants to 4.6 to use *"environmental sustainability by design"* approach) is confirmed to comply with the DNSH principle.													
5. Pollution	100%	§ 5.3 § 5.4.2 § 5.7.1	95%	§ 5.3 § 5.4.2 § 5.7.1	100%	§ 5.3 § 5.4.2 § 5.7.1	100%	§ 5.3 § 5.4.2 § 5.7.1	85%	§ 5.3 § 5.4.2 § 5.7.1	100%	§ 5.3 § 5.4.2 § 5.7.1	100%	§ 5.3 § 5.4.2 § 5.7.1
Summary of the results	The absence of significant negative impacts ensures the complying of the principle, involved in terms of air, soil and water pollution. Nonetheless, three potential moderate negative impacts have been signalled, namely the small infrastructure for risk prevention (SO 2.4), the sustainable mobility projects such as ADRIONCYCLETOUR cycle route and the potential pressures form increased tourism attendance (SO 4.6). For all of them, the proposed mitigation measure (encouraging all applicants applying to 4.6 to use "environmental sustainability by design" approach) is confirmed to comply with the DNSH principle.													
6. Biodiversity	100%	§ 5.5	80%	§ 5.5	100%	§ 5.5	100%	§ 5.5	75%	§ 5.5	100%	§ 5.5	100%	§ 5.5
Summary of the results	The absence of significant negative impacts ensures the complying of the principle. Nonetheless, three potential moderate negative impacts have been signalled, namely the small infrastructure for risk prevention (SO 2.4), the sustainable mobility projects such as ADRIONCYCLETOUR cycle route and the potential pressures form increased tourism attendance (SO 4.6). For all of them, the proposed mitigation measure (encouraging all applicants applying to 4.6 to use *"environmental sustainability by design"* approach) is confirmed to comply with the DNSH principle.													

Table 9.1: the DNSH principle assessment of the IP

10. References

Araneo F., Bartolucci E., 2021. Lo stato delle bonifiche dei siti contaminati in Italia: i dati regionali - Edizione 2021. ISPRA, Rapporti 337/21

ARSO, 2021, Slovenian Environmental Agency, Ministry of Environment and Spatial Planning: Environmental indicators in Slovenia. Source: http://kazalci.arso.gov.si/en

ARSO, 2021a. WFS service. Source: http://gis.arso.gov.si/wfs_web/faces/WFSLayersList.jspx#

ARSO. 2021b. Assessment of chemical status for Water Management Plan 2022-2027. Available at: www.gov.si/assets/organi-v-sestavi/ARSO/Vode/Stanje-voda/Ocena-kemijskega-stanja-voda-za-Nacrt-upravljanja-2022-2027.pdf

Ciscar JC, Feyen L, Soria A, Lavalle C, Raes F, Perry M, Nemry F, Demirel H, Rozsai M, Dosio A, Donatelli M, Srivastava A, Fumagalli D, Niemeyer S, Shrestha S, Ciaian P, Himics M, Van Doorslaer B, Barrios S, Ibáñez N, Forzieri G, Rojas R, Bianchi A, Dowling P, Camia A, Libertà G, San Miguel J, de Rigo D, Caudullo G, Barredo JI, Paci D, Pycroft J, Saveyn B, Van Regemorter D, Revesz T, Vandyck T, Vrontisi Z, Baranzelli C, Vandecasteele I, Batista e Silva F, Ibarreta D, 2014, Climate Impacts in Europe. Current and predicted trends in temperature variations and heat extremes. The JRC PESETA II Project. JRC Scientific and Policy Reports, EUR 26586EN.

EC (European Commission), 2018. Perpiña Castillo C., Kavalov B., Diogo V., Jacobs-Crisioni C., Batista e Silva F., Lavalle C, JRC113718, European Commission 2018 Source: https://ec.europa.eu/jrc/sites/jrcsh/files/jrc113718.pdf

EEA (European Environment Agency), 2020a, State of Nature in the EU. Results from reporting under the nature directives 2013-2018. EEA Report No 10/2020. Luxembourg: Publications Office of the European Union, 2020. ISBN 978-92-9480-259-0. Doi:10.2800/088178

EEA, 2020b, Environment noise in Europe 2020. doi:10.2800/686249

EEA, 2020c, European Environment Agency: Landscape fragmentation pressure and trends in Europe. Source: www.eea.europa.eu/data-and-maps/indicators/mobility-and-urbanisation-pressure-on-ecosystems-2/assessment

EEA, 2019, European Environmental Agency, Data and maps: Land take in Europe, www.eea.europa.eu/data-and-maps/indicators/land-take-3

EEA, 2019: The European environment — state and outlook 2020. Knowledge for transition to a sustainable Europe. European Environment Agency, Luxembourg, www.eea.europa.eu/publications/soer-2020/soer-2020/viewfile#pdfjs.action=download

EEA, 2017. Sensitivity to desertification index map, www.eea.europa.eu/data-and-maps/figures/sensitivity-to-desertification-index-map

Ercole S., Angelini P., Carnevali L., Casella L., Giacanelli V., Grignetti A., La Mesa G., Nardelli R., Serra L., Stoch F., Tunesi L., Genovesi P. (ed.), 2021, Rapporti Direttive Natura (2013-2018). Sintesi dello stato di conservazione delle specie e degli habitat di interesse comunitario e delle azioni di contrasto alle specie esotiche di rilevanza unionale in Italia. ISPRA, Serie Rapporti 349/2021.

Erhartič B., 2010, Conserving geoheritage in Slovenia through geomorphosite mapping. Available at: www.unil.ch/files/live/sites/igd/files/shared/Geovisions/Geovisions35/Geovisions35_IGUL_4_Erhartic.pdf

Eurostat. 2020. Agri-environmental indicator - soil erosion. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Agri-environmental_indicator_-_soil_erosion#Analysis_at_EU_and_country_level

eVRD, 2021. Register (Inventory) of cultural heritage: Legal regimes of cultural heritage protection, Ministry of Culture. Source: https://www.gov.si/zbirke/storitve/posredovanje-podatkov-o-kulturni-dediscini-uporabnikom/

eVRD, 2021. Register (Inventory) of cultural heritage: Legal regimes of cultural heritage protection, Ministry of Culture. Source: https://www.gov.si/zbirke/storitve/posredovanje-podatkov-o-kulturni-dediscini-uporabnikom/

Giovagnoli M.C., 2018. La tutela del patrimonio geologico e i geositi (intervista di Claudia Delfini). Geonews 2, Newsletter Servizio Geologico d'Italia.

Giustin M., Brambilla M., Celada C. Stato di conservazione e valore di riferimento favorevole per le popolazioni di uccelli nidificanti in Italia. Rivista Italiana di Ornitologia - Research in Ornithology, 86 (2), 3.

GSE, 2021. Fonti rinnovabili in Italia e nelle Regioni 2012-2019. Rapporto di monitoraggio Luglio 2021.

IPCC, 2014. Fifth Assessment Report. Cambridge: Cambridge University Press.

ISPRA, 2021. Annuario in cifre. Stato dell'Ambiente 95/2021.

ISTAT, 2019. BES 2019 - Il benessere equo e sostenibile in Italia.

JRC, 2014. Joint Research Centre Data Catalogue: LF622 – Landscape Fragmentation (LUISA Platform REF2014). Source: https://data.jrc.ec.europa.eu/dataset/jrc-luisa-lf622-landscape-fragmentation-ref-2014

MATTM (Ministero dell'Ambiente, Tutela del Territorio e del Mare), 2016. RSA2016 - Rapporto sullo stato dell'ambiente edizione 2016.

MESP, 2019. Predhodna ocean poplavne ogroženosti Republike Slovenije (2019). Source: www.gov.si/assets/ministrstva/MOP/Dokumenti/Voda/NZPO/e56d7a6180/predhodna_ocena_poplavne_ogrozenosti_2019.pdf

MESP, 2020. Ministry of the Environment and Spatial Planning, Slovenian Water Agency: e-Vode. Source:

http://www.evode.gov.si/index.php?id=119

MINSAL (Ministero della Salute), 2021. Monitoraggio dei LEA attraverso la cd. Griglia LEA - Metodologia e Risultati NZPO SI, 2017. Načrt zmanjševanja poplavne ogroženosti 2017-2021. Source: https://www.gov.si/assets/ministrstva/MOP/Dokumenti/Voda/NZPO/606504549e/nzpo_2017_2021.pdf

MOP. 2021. Draft water management plan for the Adriatic Sea basin district for the period 2022–2027 (13.12.2021)

Munafò M. (a cura di), 2021. Consumo di suolo, dinamiche territoriali e servizi ecosistemici. Edizione 2021. Report SNPA 22/21.

Munafò M., Marinosci I. (a cura di), 2018. Territorio - Processi e trasformazioni in Italia. Report SNPA 296/18.

NIJZ. 2021. Zdravje v občini. Available at: http://obcine.nijz.si/?leto=2021

NPS, 2017, Geoparks. Available at: https://www.naravniparkislovenije.si/slo/zanimivosti/geoparki

NZPO SI, 2017. Načrt zmanjševanja poplavne ogroženosti 2017-2021. Source: https://www.gov.si/assets/ministrstva/MOP/Dokumenti/Voda/NZPO/606504549e/nzpo_2017_2021.pdf

OECD, 2020. Health at a Glance: Europe 2020. Available at: https://ec.europa.eu/health/sites/default/files/state/docs/2020_healthatglance_rep_en.pdf

OECD. 2021. Health at a Glance 2021. Available at: https://www.oecd-ilibrary.org/docserver/ae3016b9-en.pdf?expires=1639580666&id=id&accname=guest&checksum=A7C4B73F2733E072C1AB1A35D9715B8A

Perpiña Castillo C., Kavalov B., Diogo V., Jacobs-Crisioni C., Batista e Silva F., Lavalle C, JRC113718, European Commission 2018. Source: https://ec.europa.eu/jrc/sites/jrcsh/files/jrc113718.pdf

Register, 2021. Register of the Intangible Cultural Heritage, Coordinator for the Safeguarding of the Intangible Cultural Heritage, Ministry of Culture. Source: http://www.nesnovnadediscina.si/en/register-of-intangible-cultural-heritage , https://data-mk-indok.opendata.arcgis.com/

Romano D., Arcarese C., Bernetti A., Caputo A., Cordella M., De Lauretis R., Di Cristofaro E., Gagna A., Gonella B., Moricci F., Pellis G., Taurino E., Vitullo M., 2020. Italian greenhouse gas inventory 1990-2019 - National Inventory Report 2021. ISPRA, Serie Rapporti 341/2021.

SFS, 2018. Slovenian Forest Service: Protective forests and Forest reserves: https://prostor.zgs.gov.si/pregledovalnik/

SNPA, 2018. Rapporto Ambiente - Ambiente in primo piano - Edizione 2017.

SNPA, 2019. Rapporto Ambiente - Ambiente in primo piano - Edizione 2018

SNPA, 2020. La qualità dell'aria in Italia. Edizione 2020. Rapporti 17/2020, Roma

SSN, 2018. Rapporto sanità - Edizione 2018.

SSN, 2019. Rapporto sanità - Speciale risorse umane - Edizione 2019.

SURS, 2021, SiStat Database, Republic of Slovenia Statistical Office: https://pxweb.stat.si/SiStat/en

Trigila A., Iadanza C., Bussettini M., Lastoria B., 2018. Dissesto idrogeologico in Italia: pericolosità e indicatori di rischio, Edizione 2018. ISPRA, Rapporti 287/2018.

UNESCO, 2021a, List of Intangible Cultural Heritage. Source: https://ich.unesco.org/en/lists?text=&country%5b%5d=00203&multinational=3&display1=inscriptionID#tabs

UNESCO, 2021b, World Heritage List. Source: https://whc.unesco.org/en/list/