DaWetRest

Danube Wetlands and flood plains Restoration through systemic, community engaged and sustainable innovative actions

EU inland waters evaluation framework and DaWetRest regulatory context

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Glossary and Abbreviations

ADRM	Association of Danube River Municipalities "Danube"
CEKOM	Competence Centre Ltd. for R&D
CELEX	Communitatis Europae Lex, unique identifier of a document in EUR-Lex
CoP	Community of Practice
DD	Danube Delta - one of the demonstration areas
DRBMP	Danube River Basin Management Plan
Dx.x	Deliverable of a task
EC	European Commission
EIA	Environmental impact assessment
ELI	European Legislation Identifier
EO	Expected outcome
EU	European Union
EUR-Lex	Webpage run by the Publications Office of the European Union
EUROVOC	European Vocabulary,
FSTP	Financial Support to Third Parties
GHG	Greenhouse gas
HRVODE	Croatian Waters
IA	Innovation action
KER	Key Exploitable Results
KPI	Key Performance Indicators
LD	Lower Danube - one of the demonstration areas
MD	Middle Danube - one of the demonstration areas
NBS	Nature Based Solutions
NN	Narodne novine, name of the Official Gazette of the Republic of Croatia
PCA	Protected Coastal Areas
PE	Population equivalent
PIRO	Municipal Integrated Development Plan (Bulgarian abbreviation)
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RUNI	University of Ruse
SDG	Sustainable development goals
SG	State Gazette - the Official Journal of the Republic of Bulgaria
SO	Specific Objective
Tx.x	Task of a given workpackage, this deliverable belongs to T2.3
UNIP	University of Pannonia
UZ-FSB	University of Zagreb - Faculty of Mechanical Engineering and Naval Architecture
WFD	Water Framework Directive
WP	Workpackage
WWTP	Wastewater treatment plant

Contents

Executive Summary **8**

1. Introduction **9**

1.1. Objectives 9

1.2. Expected impact 10

1.3. Links to other activities in the project 10

2. Methodology **11**

2.1. Initial data collection 11

2.2. Text mining of EU documents 11

2.2.1. Collecting legislative documents for further processing *11*

2.2.2. Data Refinement and Analysis *12*

2.2.3. Python codes for text mining *12*

3. Results **22**

3.1. Transnational strategic documents 22

3.1.1. Key points of Mission Ocean and Waters *22*

3.1.2. Danube basin management plan *29*

3.2. EU legislation 30

3.2.1. Biomass *32*

3.2.2. Climate *33*

3.2.3. Biodiversity and habitat *34*

3.2.4. Water *37*

3.2.5. Local economic development *39*

3.3. National legislation 40

3.3.1. Water *41*

3.3.2. Biodiversity and nature protection *46*

3.3.3. Environmental Impact assessment *49*

3.3.4. Connection between acceptability assessment and environmental impact assessment *55*

3.4. Regional strategic documents 57

4. Discussion **71**

5. Constraints and limitations **75**

References **76**

Annex 1. List of documents collected in preliminary research **77**

Annex 2. Simplified list of EU legislation used in the study **79**

List of Figures

Figure 1. Heatmap of the Similarity Matrix for 42 documents 16
Figure 2. Example of sentiment analysis, blue indicates words with negative connotation while red stands for positive notions. 21
Figure 3. One third of legislation belongs to more than one category 31
Figure 4. Number of legislative documents in each category 32

List of Tables

Table 1. Comparison of the Environment Related Missions 26
Table 2. Synergies with Other Missions 27
Table 3. Statistics of the EUR-LEX query results 31
Table 4. Sanitation Indicators for Irrigation Water Quality 44
Table 5. Comparison of acceptability assessment and environmental impact assessment .. 56
TABLE 6. List of local development plans and the priorities, constraints and solutions in the Middle Danube area 61
Table 7. List of local development plans and the priorities, constraints and solutions in the Lower Danube area 63
Table 8. List of local development plans and the priorities, constraints and solutions in the Lower Danube area 69

Executive Summary

During the first year of DaWetRest project, the consortium revisited in the regulative framework of the project activities. This allowed a more structured approach instead on leaning on the partners individual knowledge, and transnational strategic documents, EU and national legislation could be revised in a systemic manner. To assist with this exercise, human expertise was supplemented with text-mining and machine learning tools to achieve comprehensive analysis of the legal framework within the European context.

By identifying the main synergies of the different EU missions and potential clashing points, effort can be turned towards finding the best possible compromise to ensure the long-term feasibility and sustainability of the DaWetRest project activities and key performance indicators.

The current document contains a systemic analysis of the relevant EU legislation and the national legislation of the Demonstration areas, Middle Danube – Croatia, Lower Danube – Bulgaria and the Danube Delta – Romania. With the EU regulation defining the major direction of development, the countries are provided with certain freedom to adjust the rules to the constraints of local circumstances. However, this might cause discrepancies when compared to another countries legislation. By providing a side-by-side comparison of the nuances, a more strategic approach in goal setting can be achieved.

This deliverable aims to help the DaWetRest partners and any partnership in the region to equip them with better knowledge of the legislation relevant to wetland restauration works, the different EU strategies and their expectations, along with areas of potential synergies and compromises.

The deliverable first provides an insight of the goals of the task and the chosen methodology, then discusses the evaluation framework of EU inland waters and its regulatory context in the following structure: transnational strategic documents, EU legislation and the relevant national legislation of Croatia, Bulgaria and Romania. Regional and local strategic documents were also analysed. As a next step, the discussion of results and the constraints and limitation of the work is presented.

1. Introduction

Task 2.3: EU inland waters evaluation framework takes part during M01-M15, lead by UNIP. The main goal of the task was to review the applicable standards and regulatory contexts in view of setting a reference, benchmarking and updated background for the main activities to implement in the DaWetRest project. The works ensures the consistency of EU Frameworks (KPI at policy and technology levels), the Mission 'Restore our Ocean and Waters by 2030' (EC, 2021) objectives and targets, with the DaWetRest project KPI order to maximize compliance and relevance of the project aims.

As a result, the current document was created to serve as an interim standard for later project tasks, including the planning of reapplication and upscaling of DaWetRest. By reviewing the regulatory context the bottlenecks of restoration activities across nations can be revealed, hence potential setback or failure can be avoided.

The deliverable will provide input for D6.6 and D6.7, along with T2.4 and WP3 will be provided. Technical standards for assessing the potential impacts of the project activities are addressed in Task 2.5. From a project generation point of view, the gathered knowledge will help building better proposals for international calls such as Interreg programs and the Horizon calls, too. Policy wise, the project partners hope to draw attention to the diversity of the region not just from a bio-geographic or climate aspect but in a regulatory manner, despite the harmonisation efforts of the EU.

1.1. Objectives

This specific task was designed to achieve Specific Objective 1 (SO#1) set by DaWetRest: Contribute to the EU strategies, policies and other relevant directives on freshwater ecosystems protection and restoration by implementing their objectives at a local and regional level. Delivering the framework contributes to KPI#1: Transpose at least 7 EU policies, strategies and other relevant documents that concern freshwater ecosystem protection to the local level; and KPI#2: 7 national policies and strategies on freshwater ecosystem protection, restoration and management addressed by DaWetRest.

1.2. Expected impact

EO#1: Contribute to the European Green Deal, the EU Biodiversity Strategy, the EU Zero Pollution Action Plan and the Water Framework Directive as well as other EU instruments/policies on freshwater ecosystem protection.

This framework will assist the project tasks and interventions in complying with existing Legal Frameworks at various levels and help understand the limits of implementing DaWetRest solutions. Target groups: Environmental Agencies; Ministries on Environment; DDBR. Potential metrics: number of barriers/obstacles. Impact logic/ rationale: Harmonisation in legislation with new NBS need assessment.

1.3. Links to other activities in the project

The framework will provide input to the following deliverables:

- D2.5. Final integrated baseline assessment
- D2.6. Preliminary Impact assessment methodology, results and recommendations
- D2.7. Impact assessment methodology, results and recommendations (final update)
- D6.6. Policy recommendations towards harmonisation of restoration priorities and plans
- D6.7. Blueprint on DaWetRest innovations transferred to the associated regions

2. Methodology

Four levels of legislative and strategic documents were identified:

- transnational strategies (EU and international including the Ramsar Convention on Wetlands[1] and the Danube River Basin Management Plan (ICPDR, 2021)),
- EU legislation,
- national legislation (Croatia, Romania, Bulgaria) and
- regional/local development strategies.

This deliverable covers the findings of all four levels, however, further analysis of regional and local strategic documents will be also presented in the second deliverable (D2.5) of T2.4 *Baseline Assessment*. Data collection was carried out using a combination of manual methods search engines, text mining as well as large language models (LLM). Considering the focus of DaWetRest, the key areas were identified which then later served to identify keywords in the search. These were: *Water* (including freshwater as a natural resource, water use types and wastewater management), *Environment, Biodiversity, Climate, Greenhouse Gases (GHG), Air, Soil, Biomass, Food, Local Community, Circularity And Economic Development*. The following subsections detail each type of information collection.

2.1. Initial data collection

The initial phase involved the manual collection of data. Information from the Mission Ocean and Waters was compiled and legislation mentioned in the call, the DaWetRest Grant agreement and other EU Missions were used as the starting point of the snowball for the data collection. This was widened using above mentioned keywords to locate relevant pages in the European Commission website. The result was a list of strategic documents and directives which were filtered and the strategic documents were analysed separately from the regulatory works that were included in the text mining process as well. The list of documents can be found in Annex 1 and 2.

2.2. Text mining of EU documents

2.2.1. Collecting legislative documents for further processing

The legal documents from the European Union were accessed and exported from the EUR-Lex website[2], which serves as a comprehensive repository of EU law. Seven main keywords were

[1] https://www.ramsar.org
[2] https://eur-lex.europa.eu/advanced-search-form.html

identified: ***water, soil, climate, biomass, biodiversity, GHG and habitat***. The language was set to English and the search was narrowed down to two categories: Regulations, and Directives.

The advanced search and export functions of the EUR-Lex database were utilized to extract the list of relevant legal documents along with their metadata. During the export process, corrigenda were excluded to ensure that each document had a unique CELEX identifier, which simplifies subsequent analysis. The following data were collected from the database: The most important textual elements which identify the nature of a legislation include:

- **Title**: The official title of the decree.
- **ELI (European Legislation Identifier)**: A unique identifier for each legislative document.
- **Form**: The type or form of the legislation (e.g., directive, regulation).
- **EUROVOC Descriptor**: A standardized set of descriptors used for indexing and searching EU documents. It is a thesaurus available in multiple languages that covers a wide range of fields related to the EU's activities
- **Subject Matter**: The primary topic or focus of the legislation.
- **Directory Code**: A code used to classify the document within the EU's directory of legislation.

2.2.2. Data Refinement and Analysis

Post-export, documents that were no longer in force were identified and removed from the dataset. The list of legal documents has been manually reviewed to find out if there is a current consolidated version including corrigenda to ensure accuracy and completeness. During the manual screening, secondary topics and their relevancy to the project were identified.

For instance, documents related to REACH Regulation (EC 1907/2006) were excluded as their focus on registration, evaluation, authorisation and restriction of chemicals, while relevant to the protection of aquatic environment[3], does not have a direct effect on the project activities and vice versa.

2.2.3. Python codes for text mining

As a next step, documents were reviewed to identify closely related texts, enhancing the contextual relevance of the analysis. The exported metadata, which included additional keywords for uniform multilingual classification, was employed in text mining to facilitate a deeper examination of the documents.

[3] REACH related legislation contribute to the 2nd Mission Goal.

Comprehensive Python codes were developed for text mining. The codes described below automate the extraction and analysis of text from EU legislation documents. The primary aim of these codes are to facilitate the comparison and understanding of different EU decrees.

General Text Processing Functions

1. **Lemmatization**: The lemmatize_text(text) function tokenizes the text into individual words, converts each word to its base form (lemma), and rejoins the lemmatized words into a single string. In special cases this ensures that keyword matching is consistent and accurate.
2. **Keyword Counting**: An adequate function reads the PDF document, extracts text using PyPDF2 and PyMuPDF, lemmatizes the text, and counts the occurrences of each specified textual elements.
    - **PDF Collection**: The main() function defines a list of PDF file paths, each representing a different EU decree.
    - **Processing**: For each PDF, the codes checks if the file exists, then calls the adequate function to gather the specified statistics related to keywords, sentiment levels or similarity values.

Utility of the Codes

The codes are particularly useful for:

- **Automating Text Extraction**: Handling both text-based and image-based PDFs to ensure comprehensive text extraction.
- **Normalizing Text**: Using lemmatization to ensure accurate keyword matching.
- **Analysing Specific Feature Occurrences**: Providing detailed counts of specified element occurrences (e.g., keywords), and values (similarity patterns, sentiments), which helps in understanding the focus areas of different decrees.
- **Visualizing Data**: Creating visual representations of the studied text features to facilitate easy comparison across multiple documents.

By leveraging the developed Python codes, researchers, policymakers, and analysts can efficiently process and compare a large number of EU decrees, gaining valuable insights into their emphasis on environmental and climate-related topics. This systematic approach not only saves time and effort but also enhances the accuracy and depth of legislative analysis.

Comparison of the textual similarities by heatmap representation

The developed Python code (heatmap_text_skip.py) is designed to analyse and compare the textual content of EU decrees in PDF format (Figure 1). Its main goal is to measure the semantic similarity between these documents using Latent Semantic Analysis (LSA) and visualize the

results in a heatmap, as well as save the similarity scores in an Excel file for further analysis. Here is a detailed explanation of each part of the code and how it helps achieve this aim.

Libraries Used

- **os**: For file path operations.
- **fitz (PyMuPDF)**: To extract text from PDF files.
- **sklearn.feature_extraction.text.TfidfVectorizer**: To convert text into TF-IDF vectors.
- **sklearn.decomposition.TruncatedSVD**: To perform dimensionality reduction via LSA.
- **sklearn.metrics.pairwise.cosine_similarity**: To compute the cosine similarity between documents.
- **seaborn**: For data visualization.
- **matplotlib.pyplot**: For plotting.
- **pandas**: For data manipulation and saving results to an Excel file.

Functions

1. **extract_text_from_pdf(pdf_path)**:
    - **Aim**: Extracts text from a given PDF file.
    - **How**: Uses the PyMuPDF library to read the PDF and extract text from each page.
2. **preprocess_text(text)**:
    - **Aim**: Preprocesses the extracted text (currently a placeholder).
    - **How**: This function is meant to include text cleaning, tokenization, and other preprocessing steps, but currently, it returns the text as is.
3. **lsa_similarity(texts)**:
    - **Aim**: Computes the semantic similarity between a list of texts using LSA.
    - **How**:
        - Converts the texts into TF-IDF vectors.
        - Reduces the dimensionality of these vectors using TruncatedSVD (LSA).
        - Calculates the cosine similarity between the transformed vectors to obtain a similarity matrix.

Main Function

1. **main(pdf_paths)**:
    - **Aim**: Coordinates the entire process of extracting text from PDFs, computing similarities, and visualizing/saving the results.
    - **How**:
        - Filters out non-existing PDF files from the provided list of paths.
        - Extracts text from each valid PDF.

- Preprocesses the extracted texts.
- Computes the similarity matrix using LSA.
- Visualizes the similarity matrix as a heatmap using Seaborn.
- Saves the pairwise similarity scores to an Excel file using Pandas.

Workflow Description

1. **Reading PDF Files**:
   - The code starts by filtering out non-existent PDF files from the provided list.
   - It then extracts text content from each valid PDF file using the extract_text_from_pdf function.
2. **Preprocessing Text**:
   - Currently, the preprocess_text function is a placeholder for any necessary text preprocessing steps. In a real-world scenario, this could include removing stop words, stemming/lemmatization, etc.
3. **Computing Similarities**:
   - Texts are converted into TF-IDF vectors, capturing the importance of terms relative to the documents.
   - LSA is applied to reduce the dimensionality of these vectors, capturing the underlying semantic structure.
   - Cosine similarity is then computed between the LSA-transformed vectors, resulting in a similarity matrix where each element represents the semantic similarity between two documents.
4. **Visualization and Saving Results**:
   - A heatmap of the similarity matrix is generated, providing a visual representation of how similar the documents are to each other. **Figure 1** shows the heatmap of around third of the documents.
   - The pairwise similarity scores are saved to an Excel file, allowing for easy sharing and further analysis.

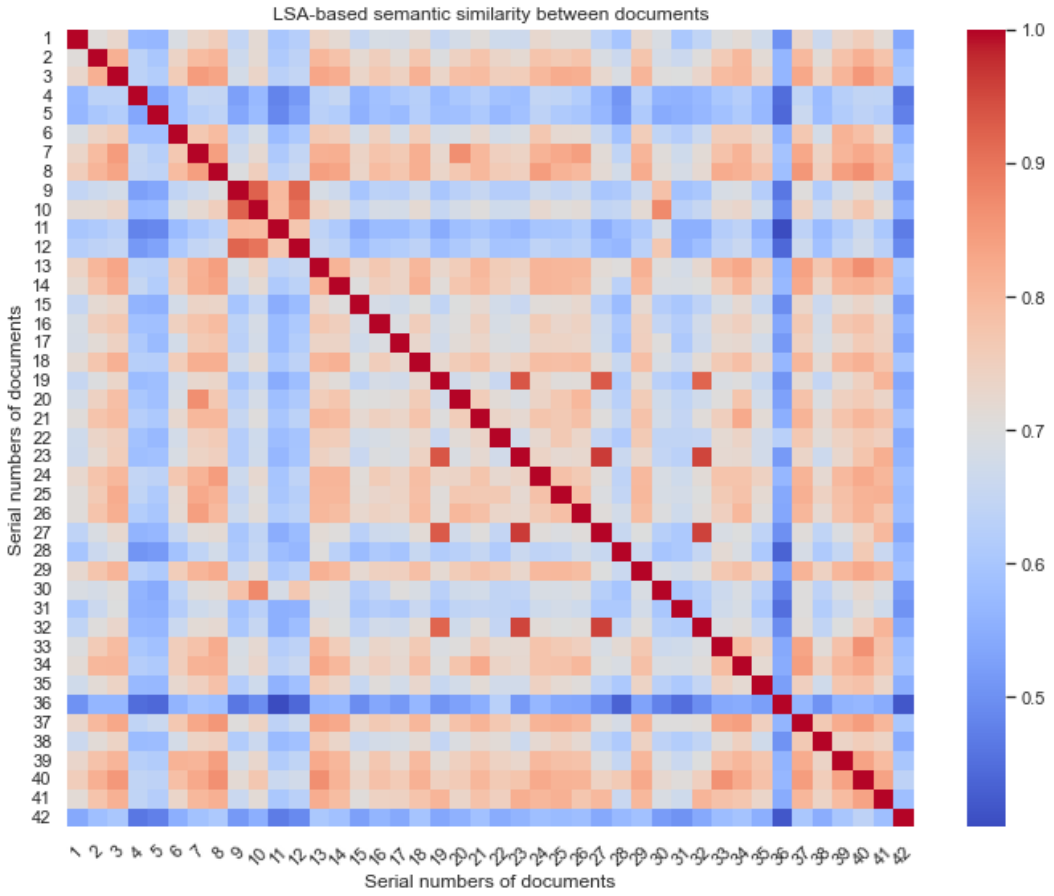


FIGURE 1. HEATMAP OF THE SIMILARITY MATRIX FOR 42 DOCUMENTS

Practical Application

This code is particularly useful for legal and policy analysis within the European Union. By comparing the semantic content of various decrees, policymakers, researchers, and legal professionals can identify:

- Redundancies and overlaps between decrees.
- Evolution of legal language and concepts over time.
- Relationships and influences between different legal documents.

Such analysis can support efforts to streamline regulations, ensure consistency in legal language, and improve the overall coherence of EU legislation.

Sentiment analysis

This Python code (sentiment_analysis_with_keywords.py) is designed to perform sentiment analysis on the text extracted from a PDF document. It uses the pdfplumber library to extract text from the PDF, the NLTK library for sentiment analysis, and matplotlib for visualization. Here is a detailed evaluation of each part of the code:

Libraries Used

- **pdfplumber**: For extracting text from PDF files.
- **nltk**: For natural language processing, including tokenization, part-of-speech tagging, and sentiment analysis.
- **numpy**: For numerical operations (though not used explicitly in this code).
- **matplotlib**: For plotting the sentiment scores of the sentences.
- **matplotlib.colors.Normalize** and **matplotlib.cm.ScalarMappable**: For normalizing and mapping sentiment scores to a color scale.

Functions and Key Operations

1. **Sentiment Intensity Analyzer Initialization**:
    - **Aim**: Initializes the sentiment analyser using NLTK's VADER lexicon.
    - **How**: Downloads the necessary NLTK data and initializes the SentimentIntensityAnalyzer.
2. **analyze_sentiment(text)**:
    - **Aim**: Analyses the sentiment of a given text and categorizes it as 'Positive', 'Negative', or 'Neutral'.
    - **How**: Uses VADER's compound score to classify sentiment based on predefined thresholds.
3. **PDF Text Extraction**:
    - **Aim**: Extracts text from the specified PDF file.
    - **How**: Opens the PDF file using pdfplumber and concatenates the text from all pages into a single string. Handles exceptions if the file cannot be read.
4. **Sentiment Calculation**:
    - **Aim**: Calculates the sentiment scores for each sentence in the extracted text.
    - **How**: Tokenizes the text into sentences and computes the compound sentiment score for each sentence using VADER.
5. **extract_nouns(sentence)**:
    - **Aim**: Extracts nouns from a given sentence.
    - **How**: Tokenizes the sentence, tags parts of speech, and selects tokens that are nouns.
6. **Visualization**:
    - **Aim**: Visualizes the sentiment scores of sentences.
    - **How**: Creates a scatter plot where the x-axis represents sentence indices, and the y-axis represents sentiment scores. Colours the points based on sentiment scores using a color map.
7. **Result Output**:

- **Aim**: Prints each sentence along with its sentiment score and extracted nouns.
- **How**: Iterates through the sentences and their corresponding sentiment scores and nouns, printing the information.

Workflow Description

1. **PDF Text Extraction**:
   - The code starts by attempting to read and extract text from the specified PDF file using pdfplumber. If it encounters an error, it prints an error message and sets the text to an empty string.
2. **Sentiment Analysis**:
   - The extracted text is tokenized into sentences using NLTK.
   - The sentiment of each sentence is analysed using VADER's sentiment analyser, resulting in a list of sentiment scores.
3. **Noun Extraction**:
   - For each sentence, the code tokenizes the text, tags parts of speech, and extracts nouns.
4. **Visualization**:
   - The sentiment scores are visualized using a scatter plot, where the x-axis represents the index of each sentence and the y-axis represents the sentiment score. The color of each point indicates the sentiment value, with a color bar showing the sentiment score range.
5. **Output**:
   - The code prints each sentence along with its sentiment score and extracted nouns.

Practical Application

This code can be useful in several contexts:

- **Document Analysis**: Provides insights into the overall sentiment and specific emotional content of the document.
- **Content Review**: Helps identify sections of a document with strong positive or negative sentiment, which can be critical for evaluating reports, articles, or other written materials.
- **Text Mining**: Extracting nouns and sentiment scores aids in understanding the key topics and emotional tone, useful for further natural language processing tasks or data mining.

Possible Improvements

- **Text Preprocessing**: Implement text cleaning steps such as removing special characters, stop words, and normalizing text to improve sentiment analysis accuracy.
- **Handling Large Documents**: For very large documents, consider processing in chunks to manage memory usage and improve performance.
- **Advanced Visualizations**: Incorporate more advanced visualizations to show sentiment trends over sections of the document.
- **Saving Results**: Save the sentiment analysis results and extracted nouns to a file (e.g., CSV or Excel) for further analysis.

Overall, this code provides a straightforward way to perform sentiment analysis on PDF documents, visualize the results, and extract key information.

Evaluation of keyword frequencies

The developed Python code (keyword_frequencies_skipping.py) aims to analyse and compare European Union decrees (PDF documents) by identifying and counting the occurrences of specific keywords related to environmental and climate issues. The main objective of this code is to automate the extraction of text from PDFs, perform text preprocessing (such as lemmatization), and then count the occurrences of predefined keywords. This can help in understanding the focus and emphasis of different decrees on certain topics. This also helps determine the relevance of a document written in a foreign language without having to manually look up each key-word.

Dependencies and Imports

- **Libraries Used**:
  - os: For file system operations.
  - PyPDF2 and fitz (PyMuPDF): For reading and extracting text from PDF files.
  - nltk: For natural language processing tasks, specifically tokenization and lemmatization.
  - matplotlib and numpy: For plotting the results.
- **NLTK Resources**:
  - Downloads punkt (for tokenization) and wordnet (for lemmatization).

Text Processing Functions

1. **lemmatize_text(text)**:
   - Tokenizes the text into words.
   - Lemmatizes each word to its base form.
   - Joins the lemmatized words back into a single string.

- This helps in normalizing the text, making keyword matching more accurate by reducing words to their root forms (e.g., "emissions" to "emission").

2. **count_keywords(pdf_path, keywords)**:
    - Initializes dictionaries to track keyword counts and presence.
    - Checks if the file is a PDF.
    - Attempts to extract text using PyPDF2 (for text-based PDFs) and fitz (for image-based or scanned PDFs).
    - Lemmatizes the extracted text.
    - Counts the occurrences of each keyword in the text and updates the dictionaries accordingly.
    - Returns the keyword count and presence for the given PDF.

Main Functionality

- **main()**:
    - Lists paths to multiple PDF files (EU decrees).
    - Defines a set of keywords related to environmental and climate issues.
    - Iterates over the list of PDF paths:
        - Checks if each file exists.
        - Calls count_keywords to get keyword statistics for each PDF.
        - Stores the results in lists.
    - Prints the keyword counts and presence for each PDF.
    - Plots the results using matplotlib:
        - Creates a bar chart where each group of bars represents the keyword occurrences in a specific PDF.
        - Labels and titles the chart for clarity.

Utility in Comparing EU Decrees

- **Text Extraction**:
    - Automates the process of extracting text from various formats of PDF documents, ensuring that both text-based and image-based PDFs are processed.
- **Text Normalization**:
    - Uses lemmatization to normalize the text, which helps in consistent keyword matching regardless of the word form used in the decrees.
- **Keyword Analysis**:
    - Counts the occurrences of important keywords related to environmental topics, which can reveal the focus areas of different decrees.
    - Identifies the presence of these keywords, highlighting which documents emphasize specific issues.

- **Visualization**:
    - Provides a visual comparison of keyword occurrences across multiple decrees, making it easier to identify trends and differences in emphasis on environmental topics.

By using this code, researchers, policymakers, or analysts can efficiently compare a large number of EU decrees, understand their focus on environmental issues, and potentially draw insights about the evolution of environmental policy over time. This automated approach saves significant manual effort and provides a systematic way to analyse and compare textual content across multiple documents.

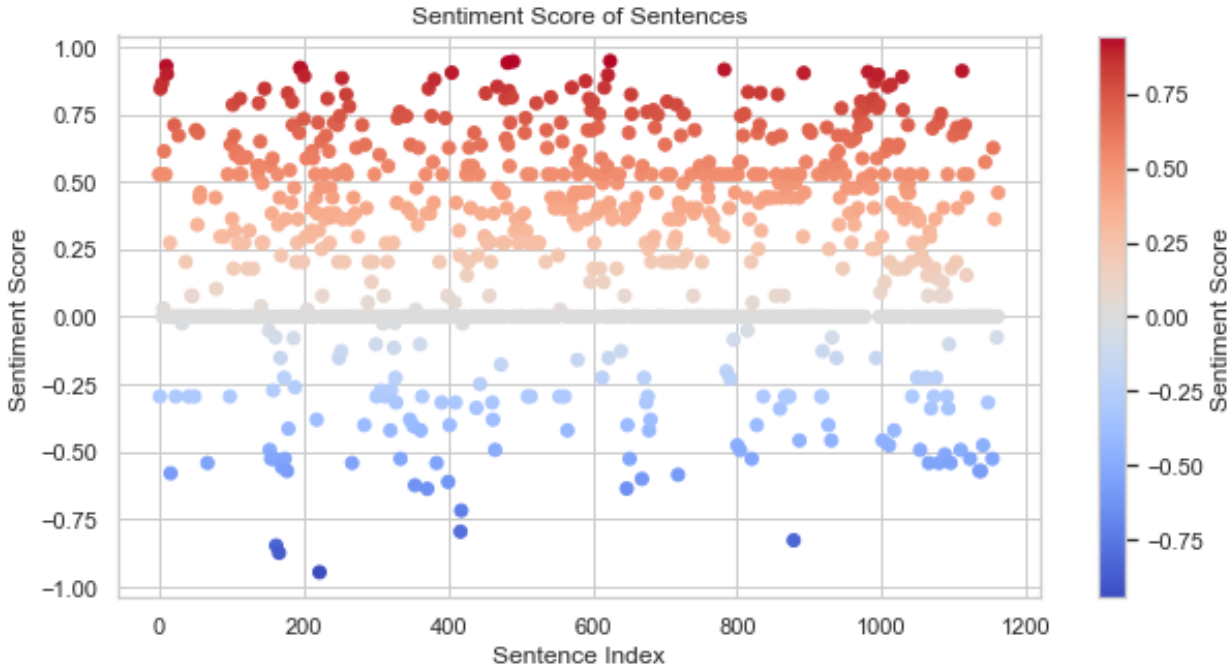


FIGURE 2. EXAMPLE OF SENTIMENT ANALYSIS, BLUE INDICATES WORDS WITH NEGATIVE CONNOTATION WHILE RED STANDS FOR POSITIVE NOTIONS.

3. Results

3.1. Transnational strategic documents

A list of documents (Annex 1) was compiled that are either on EU level or international, including treaties, conventions and preparatory documents and communications. Some documents were mentioned in the Mission Ocean and Waters but focused on the marine environment or other areas that are marginal for the objectives of the DaWetRest project. However, they were included in the list for future reference keeping sibling projects in mind as well as the associated regions in other basins. Others were legislative documents that are covered in the next chapter.

This chapter consist of a short evaluation of the Mission Ocean and Waters, its synergies with other Missions, and potential conflicts or points of compromises. Following that, some of the more significant international strategic documents and their connection to the goals of the project are highlighted.

3.1.1. Key points of Mission Ocean and Waters

The problem statement of the Mission puts EU marine waters in focus but understands that inland waters affect the health of those. According to the interim assessment of river basin management plans, only 40% of Europe's surface water bodies achieve good ecological status, 46% of the European coastal waters fail to meet good ecological status and respectively 85% and 76% of the assessed coastal waters in the Black and Baltic Seas are in less than good status (EEA, 2018.). In order to boost the restoration efforts to achieve the objectives of the Water Framework Directive (WFD) and support the goals of the Green Deal, three main objectives were defined:

- Protect and restore marine and freshwater ecosystems and biodiversity,
- Prevent and eliminate pollution of our ocean, seas and waters,
- Make the sustainable blue economy carbon-neutral and circular.

These objectives are to be achieved by innovative solutions that are considered on a basin level (sea basin and river basin). The mission identified tools, such as the digital ocean and water knowledge system and participatory governance. The former aims to understand, monitor and forecast the health of the hydrosphere utilising existing infrastructures (Copernicus, EMODnet, Destination Earth, ERICS). However, without extensive on-site monitoring system, there is not sufficient data to build a robust digital system therefore data collection is key to understand any part of the hydrosphere let alone provide reliable forecasts. Participatory governance concentrates on mobilising and engaging citizens, for them to take actions and participate in decision making. According to the Mission this can be achieved by social innovation, citizen science and awareness campaigns. The importance of participation is a new idea, for instance the EU directive on the

assessment of the effects of certain public and private projects on the environment (2011/92/EU) states that the public has to be informed in a suitable manner and given early and effective opportunities to participate in the decision making process. The means and timeframes are however regulated by the Member States that might cause standardisation issues and some allowed methods might not be effective in involving the citizens (central portal, local newspaper or bill postings). The Mission also addresses the fragmentation of research disciplines and knowledge systems and the need to structure efforts across governments, boundaries and water bodies.

There are two main phases defined by the Mission:

1. Development and piloting phase (2021-2025) – Lighthouses

Four lighthouses were defined and each was allocated one main focus area.

- Danube and Black Sea Lighthouse: centralise governance structures along the Danube river basin, and foster a stronger innovation ecosystem for improved ecological restoration, protection and preservation.
- Mediterranean Lighthouse: prevent and eliminate pollution of our ocean, seas and waters (reduce by at least 50% plastic litter at sea, reduce by at least 30% microplastics released into the environment, reduce by at least 50% nutrient losses, the use and risk of chemical pesticides)
- Atlantic and Arctic basin lighthouse: protect and restore marine ecosystems and biodiversity, foster a dynamic entrepreneurial innovation ecosystem; comprehensive and fair catalogue of scientific and practical knowledge, making it accessible to stakeholders. According to the Mission document, this Lighthouse makes the most of cross-Mission synergies.
- Baltic and North Sea basin lighthouse: facilitate the development of a sustainable, carbon-neutral, and circular blue economy in the Baltic and North Sea (by creating a conducive governance model).

The lighthouses heavily rely on international cooperation, all member states are involved. However, there seems to be a slight imbalance towards the marine environment, as only the Danube and Black Sea lighthouse focuses on the restoration of freshwater habitats and groundwater is not mentioned at all in the Mission. Of course, all lighthouses have responsibilities to make progress towards all the targets.

In the 2. ‘deployment and upscaling’ phase (2026-2030) dynamic investment ecosystem will be provided for facilitating the upscaling:

- Extension of Mission lighthouses

- Blue Parks - expansion of networks of marine protected areas
- Scale up actions for further deployment and replication of solutions
- Citizen science, literacy campaigns and engagement
- Completion of Digital Twin Ocean
- Building of dynamic investment ecosystem
- Other Enabler actions

The Mission goals align and therefore assist in meeting the targets set in the following documents:

- EU Biodiversity Strategy 2030 – Mission's SO.1.
- EU Action Plan Towards Zero Pollution for Air, Water and Soil – Mission's SO.2
- European Climate Law – Mission's SO.3
- Marine Strategy Framework Directive – Mission's SO.1 and 2
- Common Fisheries Policy – Mission's SO.1
- EU Strategy on Adaptation to Climate Change - – Mission's SO.3
- Water Framework Directive – Mission's SO.1 and 2
- Circular Economy Action Plan -– Mission's SO.3
- EU Strategy for Plastics in the Circular Economy – Mission's SO.3
- EU Chemicals Strategy for Sustainability– Mission's SO.2
- European Bioeconomy Strategy – Mission's SO.3
- Urban Waste Water Treatment Directive – Mission's SO.2
- Barcelona Convention – Mission's SO.1 and 2
- Sustainable Blue Economy Strategy – Mission's SO.3 (freshwater is marginal)
- Marine Spatial Planning Directive – Mission's SO.2 and 3
- EU Offshore Renewables Energy Strategy – Mission's SO.3
- EU Smart and Sustainable Mobility Strategy– Mission's SO.3 and 2
- EU Strategy on Energy System Integration– Mission's SO.3
- EU Hydrogen Strategy – Mission's SO.3
- EU Farm to Fork Strategy – Mission's SO.1, 2 and 3
- A Europe Fit for the digital age – digitalisation
- European Neighbourhood Policy – horizontal priorities
- Global Approach to Research and Innovation – horizontal priorities
- EU-US agenda for global change– horizontal priorities
- EU Arctic Policy – Mission's SO.1, 2 and 3
- International Ocean Governance – Mission's SO.1, 2 and 3.

Analysing the Mission Ocean and Waters from a freshwater perspective, one has to come to the conclusion that the Mission focuses on the marine environment. Freshwater is mentioned in relation with restoration goals (1 out of 4 specific objectives), natural capital degradation and droughts. The Danube River Basin being the most international river basin to host one of the four lighthouses allows to cover all EU states, including the landlocked countries such as Austria, Czechia, Slovakia and Hungary beside the two countries by the Black Sea (Romania and Bulgaria). Should the naming follow the logic of other lighthouses the lighthouse would be named Black Sea shifting the emphasis to marine (and coastal) environment. By naming the lighthouse Danube (Black Sea added later) suggests that the Commission realised the importance of protecting Europe's freshwater and the connectedness of freshwater and marine waters. However it still feels that rivers and lakes are inferior to seas and oceans, despite the fact that around 80% of pollutants are of land-based sources.

Comparison with other missions

Four out of the five missions are interrelated and by providing a healthier environment they also contribute to the Mission Cancer[4]. A comparison between the implementation plans for oceans and waters, climate adaptation, cities, and soil health are in **Table 1.** The have distinct target audiences and specific objectives but they share common goals and strategies, particularly in their focus on nature-based solutions, technological innovation, and public engagement. Activities within a mission can potentially serve other missions' goals but there are areas where compromises might be necessary. Resource allocation, land use, and policy prioritization present potential conflicts. To mitigate these, integrated planning, shared funding mechanisms, and collaborative governance are necessary. This approach will require ongoing dialogue, flexible strategies, and a commitment to integrated planning and action. The connection between the Mission Ocean and Waters and other Missions are listed in **Table 2.**

[4] Cancer: working with Europe's Beating Cancer Plan to improve the lives of more than 3 million people by 2030 through prevention, cure and solutions to live longer and better

TABLE 1. COMPARISON OF THE ENVIRONMENT RELATED MISSIONS

Aspect	Ocean and Waters	Climate Change Adaptation	Climate-Neutral Cities	Soil Mission
Objective	Restore ocean and waters by 2030	Support 150 regions to become climate-resilient by 2030	100 climate-neutral cities by 2030	Achieve healthy soils in Europe by 2030
Target Audience	EU marine and freshwater ecosystems	EU regions vulnerable to climate change	EU cities	EU agricultural and natural landscapes
Key Strategies	Ecosystem restoration, pollution reduction, sustainable blue economy	Risk assessments, innovation, large-scale demonstrations	Urban planning, green infrastructure	Soil restoration, sustainable land management
Main Activities	Protect marine biodiversity Reduce pollution Blue economy development	Understanding climate risks Mobilizing support Testing solutions	Promote sustainable urban transport Improve energy efficiency	Improve soil health Reduce soil pollution Enhance carbon sequestration
Budget	Horizon Europe, LIFE Programme, ERDF EMFF	Horizon Europe Cohesion Policy Common Agricultural Policy	Horizon Europe ERDF private investments	Horizon Europe CAP LIFE Programme private investments
Innovations and Technology	Marine spatial planning, advanced monitoring systems	Nature-based solutions, digital twins, early warning systems	Smart grids, renewable energy solutions	Soil monitoring technologies, sustainable farming practices
Engagement	Citizens, Stakeholders in marine and water sectors	Citizen and stakeholder engagement, policy forums	Citizen engagement, participatory governance	Farmers, landowners, policymakers
Expected Outcomes	Healthier marine freshwater ecosystems Sustainable economic activities	Enhanced climate resilience in 150 regions Systemic transformations in 75 regions	100 climate-neutral cities Improved urban living standards	Improved soil health Increased biodiversity Enhanced climate resilience

There are synergistic areas specific to the Mission Ocean and the DaWetRest project that facilitate meeting the other missions' targets as well. Floodplain restoration can reduce flood risks, improve water quality, and enhance biodiversity, benefiting both climate resilience and freshwater ecosystems. Wetland Conservation can sequester carbon, provide habitat for wildlife, and act as natural water filters, supporting both climate adaptation and water quality goals. Developing integrated monitoring systems for water levels, quality, and climate impacts can provide early warnings and support adaptive management strategies for river basins. Promoting sustainable agricultural practices can reduce water consumption, prevent soil erosion, and decrease nutrient runoff, benefiting freshwater ecosystems and increasing climate resilience. This closely connect to the goals of the Farm to Fork strategy. Additionally, creating policies that address both water

management and climate adaptation can ensure coordinated actions and maximize the benefits for river basins and inland waters.

TABLE 2. SYNERGIES WITH OTHER MISSIONS

Other missions	Protecting and restoring aquatic ecosystems	Reducing pollution	Climate-neutral blue economy
Soil Deal for Europe	direct thematic	direct thematic	cross-cutting
Climate Change Adaptation Mission	direct thematic	cross-cutting	indirect
100 Climate-Neutral and Smart Cities by 2030	cross-cutting	direct thematic	direct thematic

Ocean and Waters Implementation Plan assisting other plans:

1. **Climate Change Adaptation Mission**: Healthy marine and freshwater ecosystems can act as natural buffers against climate impacts, such as storm surges and flooding, enhancing resilience in vulnerable regions. Specifically, restoration of wetlands can provide natural flood protection, reducing the need for engineered defences.
2. **Cities Mission**: Sustainable management of urban waterways and coastal zones can improve water quality and reduce urban heat island effects. Creating green urban areas and restoring urban rivers can enhance biodiversity and provide recreational spaces, improving urban living standards.
3. **Soil Mission**: Reducing water pollution and implementing sustainable land use practices can prevent soil degradation and enhance agricultural productivity. An example would be implementing buffer strips along rivers to filter runoff, which can improve both water and soil quality.

Climate Change Adaptation Mission Assisting Other Plans:

1. **Ocean and Waters Implementation Plan**: Implementing climate adaptation strategies can reduce climate-related stress on marine and freshwater ecosystems, supporting their restoration and conservation. Enhancing resilience to sea level rise and temperature changes can help maintain biodiversity and ecosystem services.
2. **Cities Mission**: Promoting climate-resilient urban planning and integrating nature-based solutions can reduce the impact of extreme weather events such as flooding or heat wave on cities, e.g., green roofs and permeable pavements.

3. **Soil Mission**: Implementing adaptive agricultural practices, e.g. crop diversification and conservation agriculture can enhance soil health and resilience to climate change, improving food security.

Cities Mission Assisting Other Plans:

1. **Ocean and Waters Implementation Plan**: Reducing urban runoff and improving wastewater management can decrease pollution entering marine and freshwater ecosystems. One way to achieve that is to implement green infrastructure in settlements of any size.
2. **Climate Change Adaptation Mission**: Tools such as early warning systems and climate-adaptive building codes can protect urban areas from extreme weather events. In general, enhancing urban resilience to climate impacts can reduce the overall vulnerability of the population and infrastructure.
3. **Soil Mission**: Promoting urban agriculture and green spaces such as community gardens and green roofs can improve soil health and provide local food sources while enhancing urban biodiversity.

Soil Mission Assisting Other Plans:

1. **Ocean and Waters Implementation Plan**: Implementing sustainable land management practices can reduce soil erosion and sedimentation in waterways, protecting aquatic habitats. Practices like no-till farming and cover cropping can prevent soil loss and improve water quality.
2. **Climate Change Adaptation Mission**: Enhancing soil health can increase the resilience of agricultural systems to climate impacts, such as drought and extreme temperatures due to enhanced water retention and reduced need for irrigation.
3. **Cities Mission**: Promoting green infrastructure and sustainable land use in urban areas can assist stormwater management and reduce flooding which provides benefits for both urban residents and downstream ecosystems.

Potential Conflicts of Interest:

1. Resource Allocation: Competing for funds from similar sources (e.g., Horizon Europe, LIFE Programme) could limit the resources available for each plan.
2. Land Use: Urban expansion (Cities Mission) may conflict with the need to preserve and restore soils (Soil Mission) and coastal ecosystems (Ocean Mission).

3. Policy Prioritization: Balancing the immediate need for urban climate resilience (Cities Mission) with long-term goals of soil health (Soil Mission) and marine and freshwater ecosystem restoration (Ocean and Waters Mission) might lead to prioritization conflicts.

Necessary Compromises:

To avoid the above mentioned conflicts special attention has to be paid to develop integrated land-use and water management plans that address the needs of urban, rural, and coastal areas to ensure that goals across different missions do not conflict. Funding should be prioritised for those plans that support synergies and collaborative governance frameworks have to be created that include representatives from all sectors to ensure coordinated policy implementation and conflict resolution.

Here are a few examples of potential conflicts and their resolutions:

1. **Coastal Wetland Restoration Projects**:
    - **Conflict**: Coastal urban expansion vs. wetland conservation. Previous urban design solutions may also cause conflicts between meeting social and environmental needs.
    - **Compromise**: Implementing buffer zones and sustainable urban planning to allow for both urban growth and the conservation of critical wetlands.
2. **River Basin Management**:
    - **Conflict**: Agricultural water use vs. river ecosystem health.
    - **Compromise**: Implementing water-saving technologies in agriculture and creating policies that allocate water resources sustainably between agricultural needs and ecosystem preservation. Adjusting agricultural practices to nature-based solutions for water retention might seem a compromise in profitability but increases drought resistance in the long term.

3.1.2. Danube basin management plan

The river basin management plans (transnational, national and sub-basin level) provide status assessment (reference year: 2018), visions on meeting the targets of the Water Framework Directive and measures to achieve that. Basin-wide, the following visions were formulated:

1. **Zero emission of untreated wastewaters into the waters of the Danube River Basin District** - While DaWetRest focuses on restoration activities, its activities include knowledge transfer on wastewaters and their influence on wetlands and flood plains

among local stakeholders with the aim of promoting a more sustainable wastewater management in the demo regions.

2. **Balanced management of nutrient emissions** via point and diffuse sources to mitigate the threat of eutrophication: zero untreated wastewater discharge and sustainable agricultural practices contribute to this goal. –DaWetRest contributes to this goal by educating on water use and wastewater management practices. Reed management can directly contribute to nutrient uptake thus mitigate the occurrence of eutrophic circumstances.
3. **Mitigation of hazardous substances pollution** – Due to the setup of the project the consortium can only gather knowledge of potential pollution sources, nonetheless involving the owners of the industrial and agricultural facilities as stakeholders into the discussion could create a proactive environment to avoid the threat of accidents and unwanted spills. Wetlands can also act as a buffer zone and retain water as well as pollutants. However, for the long-term health of the habitats, pollutions should be controlled at the source.
4. **Hydro-morphological alterations –** the DRBMP envisions that alterations do not influence the aquatic ecosystem in a negative manner. This includes the removing interruptions of river continuity, restoration of hydrological regime, and habitats to ensure improvement of water status/potential and aquatic ecosystems and which are the focus areas of DaWetRest.

3.2. EU legislation

Using the seven keywords for identifying relevant legislative documents, seven queries were carried out which retrieved 1040 record **(Table 3**). After removing repeated items, 641 records remained. One third of the legislations are classified under multiple categories **(Figure 3)**. Interestingly, the keyword ‘soil’ gave the highest number of documents. However during filtering by relevancy, most of them were omitted from the later steps **(Figure 4)**. The highest number remained for ‘habitat’, followed by ‘soil’, while GHG had the lowest value which could be considered as a sub-category for climate. The list of legal documents are in Annex II. and will be available on the Digital Platform with the effort to maintain its topicality.

This chapter briefly outlines the legislation most relevant to DaWetRest. The laws included either directly impact the project's activities or establish targets that the project can help achieve.

Two main categories of legislative documents were considered in this study, regulations and directives. Regulations have general application, are binding in their entirety and are directly applicable in all Member States. Directives on the other hand, are binding regarding the results to

be achieved, but Member States have a certain degree of freedom on how they adapt the requirements in their laws. This can lead to discrepancies in how the same activities are managed across different countries. In this chapter, the documents are first analysed by topic, followed by a separate identification of key regulations and directives. This approach will help clarify where national legislation needs to be compared.

TABLE 3. STATISTICS OF THE EUR-LEX QUERY RESULTS

Total number of records before removing duplums	**1040**
Number of legislative documents without duplication	641
Number of directives and regulations for each keyword search	
biomass	141
soil	355
biodiversity	94
climate	116
GHG	59
water	125
habitat	150

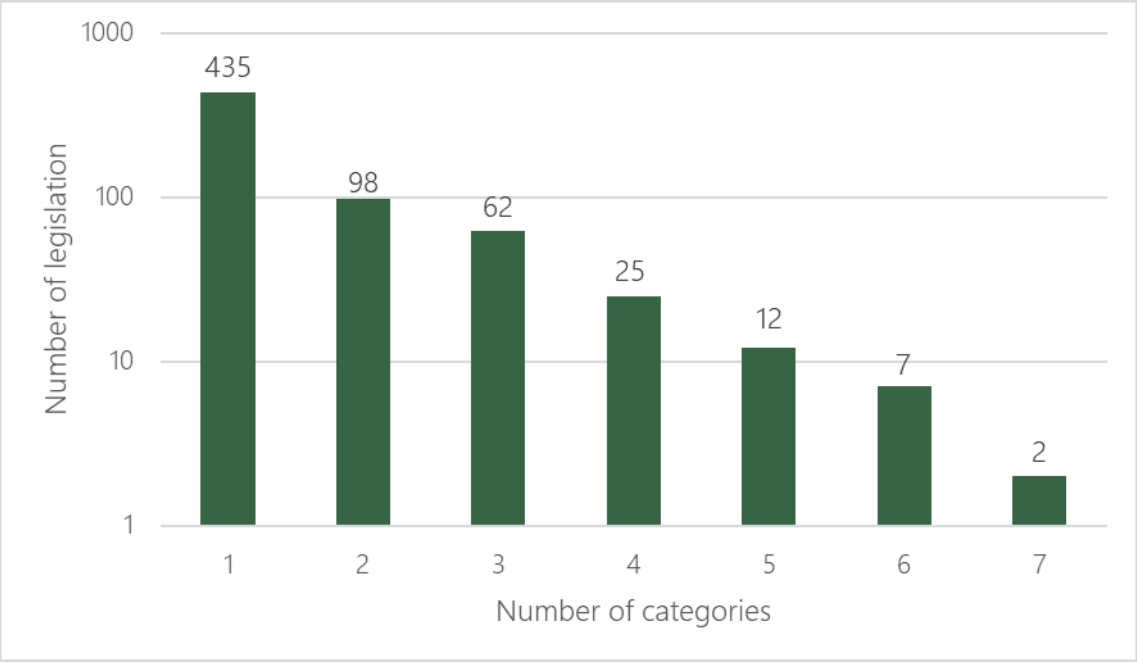


FIGURE 3. ONE THIRD OF LEGISLATION BELONGS TO MORE THAN ONE CATEGORY

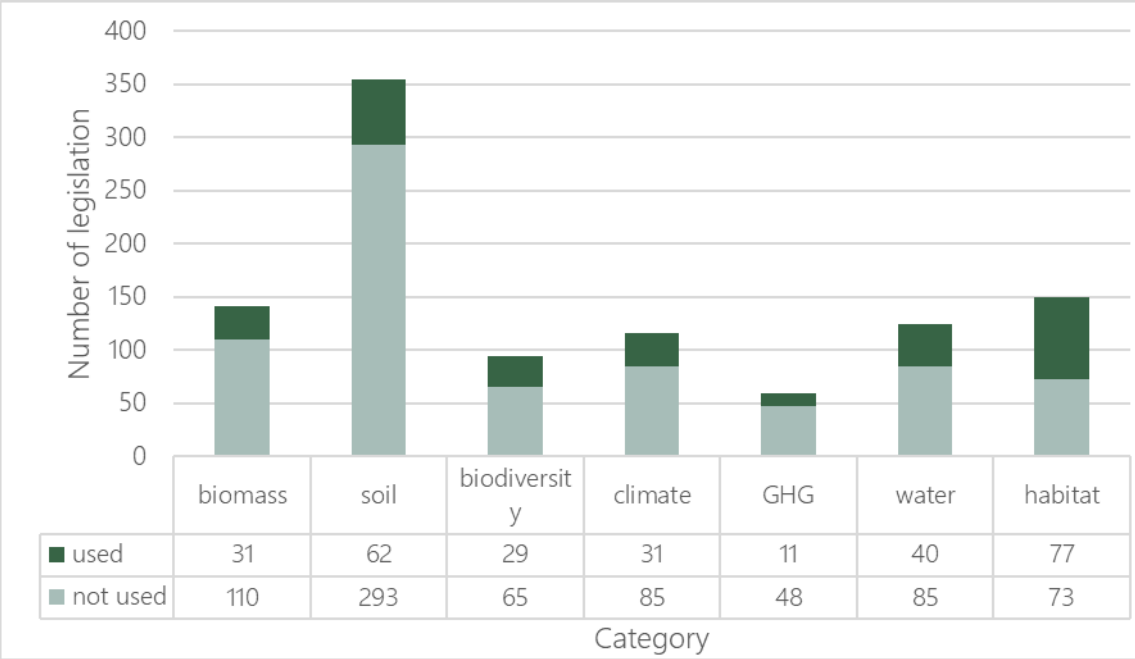


FIGURE 4. NUMBER OF LEGISLATIVE DOCUMENTS IN EACH CATEGORY

3.2.1. Biomass

Due to the nature of the project, legislation related to the water cycle (both in natural and urban settings), nature protection (including soil and habitat) and environmental impact assessment (EIA) are crucial. Most of the records falling in the biomass category focus on energy, fuel or fertilisers and their respective pollutant effects. There are three documents of interest falling under this category, two regulations and one directive. The former were retrieved with the other six keyword searches (and were categorised further as laws covering local economic development (LED)), while the directive misses the habitat category. From a project perspective, biomass production in wetlands relates to the carbon sequestration tasks.

Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products and repealing Council Regulation (EC) No 834/2007:

- This regulation provides rules on under what circumstances can products from agriculture, including aquaculture and beekeeping considered and labelled organic. Algae cultivation and aquaculture animal are included in the regulation. Considering the possible business routes in the Demo Regions, this might be useful to study for the local stakeholders.

Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development

(EAFRD) and repealing Council Regulation (EC) No 1698/2005: provides a framework for rural development and the common agricultural policy.

- The priorities include restoring, preserving and enhancing ecosystems related to agriculture and forestry; promoting resource efficiency and a low carbon and climate resilient economy with focus on efficient and sustainable water management in the sector. Short food supply chain and social inclusion are also among the priorities. Article 46 covers the topic of irrigation.

Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU (Text with EEA relevance):

- The regulation requires Member States to account for GHG emissions and removals from managed wetlands starting in 2026, with an option for early inclusion from 2021 to 2025 if notified by December 2020.

Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast) (amended by **Directive (EU) 2023/2413)**:

- The directive determines whether biofuels, bioliquids and biomass fuels produced from agricultural biomass can or cannot be accounted as sustainable, among other topics. Harvesting raw materials from wetlands is only allowed if evidence is provided that it does not interfere with nature protection purposes.

3.2.2. Climate

Eight of the records falling under the climate category overlap with the biomass category and all but two are related to energy production, efficiency and pollution, including GHG. The two regulations regulate labelling of organic products and sustainable biomass production both of which might be relevant to local businesses.

Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'):

- Member States must adopt and implement national adaptation strategies and plans. These plans are valuable resources for identifying how DaWetRest and similar projects can contribute to the targets of the European Climate Law.

Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 (amended by Regulation (EU) 2023/857):

- Member State have to reduce their greenhouse gas emission by 2030 (base year is 2005) Bulgaria: -10%, Croatia: -16.7%, Hungary: -18.7%, Romania: -12.7%. As a comparison, Luxembourg and Sweden have to achieve -50%. Bulgaria's target is the lowest.

3.2.3. Biodiversity and habitat

The biodiversity and habitat categories are very close in topic, there are 17 instances that a record falls under both categories. However 60 documents were retrieved with the 'habitat' keyword that did not with 'biodiversity' and 12 the other way round. Topics under this category cover nature protection, including species and their habitat, regulation against invasive species and assessing and dealing with environmental damage.

Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species (amended by Regulation (EU) 2016/2031):

- It applies to all invasive species. That includes both alien species to the EU and species invasive alien species of regional concern. Member states must develop action plans for preventing alien species entering their territories as well as managing already wide spread invasive species. Member States must implement restoration measures for ecosystems degraded by invasive alien species if cost-benefit analysis supports that (cost and benefits are not just monetary). These measures are expected to help ecosystems resist and recover from disturbances and prevent reinvasion after eradication efforts.

Commission Regulation (EU) 2021/57 of 25 January 2021 amending Annex XVII to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards lead in gunshot in or around wetlands:

- This amendment to REACH is specific in a sense that a 100 m buffer zone has to be kept where using or carrying gunshot with 1% or more lead by weight while hunting in wetlands is prohibited.

Council Regulation (EC) No 338/97 of 9 December 1996 on the protection of species of wild fauna and flora by regulating trade therein (amended multiple times, last by Commission Regulation (EU) 2023/966):

- It provides a several lists of species that either need protection or monitoring and regulates there trade. The regulation refers to the Convention on International Trade in Endangered Species of Wild Fauna and Flora in the Community.

Council Regulation (EC) No 708/2007 of 11 June 2007 concerning use of alien and locally absent species in aquaculture:

- The Regulation establishes a framework governing aquaculture practices to minimise threats from aquaculture species on aquatic habitats. This is to ensure that translocated species do not have adverse effects on biodiversity. Risk assessment before translocation or release has to be carried out.

Commission Regulation (EC) No 535/2008 of 13 June 2008 laying down detailed rules for the implementation of Council Regulation (EC) No 708/2007 concerning use of alien and locally absent species in aquaculture:

- It defines the criteria of adding species to the list of species that can freely be translocated (several sturgeon species are included).

Regulation (EU) 2024/1991 of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869

- The regulation establishes an area-based nature restoration framework requiring Member States to implement effective restoration measures. Its goal is to collectively restore at least 20 % of land area and 20 % of sea area across the EU by 2030, and to restore all ecosystems in need by 2050. For this national restoration plans have to be developed (Chapter III). Types of wetlands are listed in Annex I. group 1. Annex VII provides a list of restoration measures to be included in the plans depending on specific national and local conditions, and the latest scientific evidence. Several examples coincide with the goals of the DaWetRest project.

Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds:

- One of the most important legislation that established the objectives of the project. Protection and restoration of wetlands will also safeguard wild birds, especially the water fowls through protecting their habitat. Member States must maintain bird populations at levels fulfilling ecological, scientific, and cultural needs, considering economic and recreational factors. Specific measures include creating protected areas, managing habitats, and restoring or creating biotopes. Special attention is given to species in danger, vulnerable, rare, or requiring particular habitat conditions, with designated special protection areas for these species. General prohibitions cover deliberate killing, capturing, and disturbing of birds, along with restrictions on the sale of certain bird species.

Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides (amended by Commission Directive (EU) 2019/782):

- To ensure the protection the aquatic environment and drinking water supplies from the impact of pesticides, Member States have to adopt preventive measures, for example creating buffer zones around said areas where pesticides cannot be stored or used. Additionally in

certain protected areas (with regards to the WFD, the Birds and the Habitat Directive) the use of pesticides should be limited and biological control measures should be prioritised.

Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage:

- This directive sets rules for the "polluter pays" principle, including preventive measures in case of imminent threat, remedial actions which aim to restore the original status of the environment Environmental damage to water, protected species or habitats should be remedied to restore the environment to its baseline condition. Identification of remedial measures involves selecting actions to restore resources quickly or naturally, and using equivalence or valuation techniques if direct restoration isn't possible. Choice of the remedial options considers factors like public health, cost, success likelihood, and benefits to ensure the most effective and appropriate measures are implemented.

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:

- Environmental assessment is crucial to avoid damages or adverse effects of any plan or program. It has to be carried out for any plan or program regarding agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use that can have significant environmental effects. Criteria of significance is determined in the directive. Results are issued in an environmental report. This is not the same as an environmental impact assessment.

Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (amended by Directive 2014/52/EU):

- As opposed to Directive 2001/42/EC this legislation covers public and private projects with significant environmental impacts. A project is defined as the execution of construction works, the installation of other schemes, or interventions in natural surroundings and landscapes, including those involving the extraction of mineral resources. The environmental impact assessment process involves several key steps: developer prepares the environmental impact assessment report, consultations are carried out with stakeholders and the public, the competent authority examines the report, asks for additional information if necessary and gives a reasoned conclusion of the environmental impacts and actions needed to avoid them. The conclusion has to be integrated in further steps of the project. Member states have some flexibility in how and when they apply the requirements of the Directive therefore it is crucial to consult the national legislation and competent authorities before starting the planning process of investments with potential significant environmental effects. Judging from the findings on EIA in the V4 countries (Gałaś, 2015) deviations may be expected in other countries legislation, too.

Directive 2008/99/EC of the European Parliament and of the Council of 19 November 2008 on the protection of the environment through criminal law:

- Provides definition on what actions or events count as a criminal offence. This allows the Member States to hold legal persons liable for said offences adding more emphasis on environment protection.

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (amended by 2006/105/EU, 2013/17/EU):

- The directive aims to preserve and enhance biodiversity by conserving natural habitats and wild fauna and flora. Consequently, the Natura 2000 ecological network was established to maintain or restore habitats to a favourable conservation status. Each Member State is required to contribute to the creation of Natura 2000, based on the natural habitat types and species habitats represented within its territory.

3.2.4. Water

- Due to the main objectives of the project, the category of 'water' contains several important legislative pieces. Forty records remained after the first filtering process. However, in several aspects, the River Basin Management Plans serve as reference for the work, which are derivatives of the Water Framework Directive. The Urban Wastewater Treatment Directive did not come up during the queries, however the current version and its proposed new version are also an important guide in meeting the targets of the Mission Ocean and Waters. Here are some of the legislation that are also relevant and in the category of water.

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

- This regulation aims to ensure that reclaimed (waste)water is safe for agricultural irrigation. This provided a EU wide standard for wastewater reuse, filling out the gap that was before with regards to the statement of the Urban Wastewater Treatment Directive (91/271/EEC, Article 12 paragraph 1): „Treated waste water shall be reused whenever appropriate." While wastewater reuse is not among the objectives of DaWetRest, it is worth assessing the options with regards to the local circumstances in the demo areas, sibling sites and associated regions.

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy:

- The Water Framework Directive (WFD) aims to protect and enhance the status of aquatic ecosystems, including inland surface waters, transitional waters, coastal waters, and groundwater. It requires Member States to achieve good status for all water bodies by 2027. The directive mandates measures to prevent the deterioration of water quality and to mitigate the effects of floods and droughts. Member States must monitor water status, reduce pollution, and ensure sustainable water use. The WFD also emphasizes public participation

and the integration of water policies across different sectors. River basin management plans have to be prepared and revised periodically at three different levels: catchment area, national and sub-basin level.

Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council (amended by Directive 2013/39/EU):

- It sets the environmental quality standards for priority substances and certain other pollutants. This serves to meet the achieving good surface water chemical status. Member States have to monitor the occurrence of said substances and have to include the information in their river basin management plans. Based on the data, measures to improve the water quality have to be carried out.

Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks:

- It establishes a framework for the assessment and management of flood risks. Management plans for river basins have to be coordinated with the respective river basin district. The management plans must focus "on prevention, protection, preparedness, including flood forecasts and early warning systems and taking into account the characteristics of the particular river basin or sub-basin. Flood risk management plans may also include the promotion of sustainable land use practices, improvement of water retention as well as the controlled flooding of certain areas in the case of a flood event."

Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration (amended by Directive 2014/80/EU):

- This directive establishes specific measures in order to prevent and control groundwater pollution. It complements the provisions of the Water Framework Directive. With regards to the DaWetRest project, any intervention concerning groundwater, should it be used for irrigation or restoring the water levels of a lake should take into consideration the quantity and chemical status of said subsurface water body and avoid any pollution entering the groundwater.

Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption (recast):

- Contains the rules of ensuring safe drinking water, including monitoring water quality, parameters and frequency of measurement. Member States can set stricter standards for water quality, the directive sets the minimum requirements. There is an exemption for "water intended for human consumption from an individual supply providing less than 10 m^3 a day as an average or serving fewer than 50 persons, unless the water is supplied as part of a commercial or public activity". This directive directly links to the Water Framework Directive,

specifically with regards to monitoring and risk assessment of underground and surface water resources. The effects of climate change have to be considered in the risk assessment of the supply system and when ensuring access to safe drinking water in public spaces.

3.2.5. Local economic development

The majority of laws falling in the 'soil' category were either filter out or considered in a different category. As a keyword, LED was not used but some of the legislation may be of guidance for the economic activities of the Demo areas, the sibling sites and for the applicants of the Call for Associated Regions.

Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013 amended by Regulation (EU) 2024/1468:

- These two regulations together provide a framework for the preparation of strategic plans under the Common Agricultural Policy. The strategies themselves can serve with insights on what routes the local communities could or should choose when preparing their LED plans.

Regulation (EU) 2024/1143 of the European Parliament and of the Council of 11 April 2024 on geographical indications for wine, spirit drinks and agricultural products, as well as traditional specialities guaranteed and optional quality terms for agricultural products, amending Regulations (EU) No 1308/2013, (EU) 2019/787 and (EU) 2019/1753 and repealing Regulation (EU) No 1151/2012:

- It is important for those areas with product of protected designations of origin and protected geographical indications (wine, foodstuff and spirits).

Regulation (EU) No 251/2014 of the European Parliament and of the Council of 26 February 2014 on the definition, description, presentation, labelling and the protection of geographical indications of aromatised wine products and repealing Council Regulation (EEC) No 1601/91 (modified by Regulation (EU) 2021/2117)

- It lays down rules on the definition, description, presentation and labelling of aromatised wine products. It becomes relevant if any of the areas have products of these sorts or have plans to enter the market.

Regulation (EC) No 66/2010 of the European Parliament and of the Council of 25 November 2009 on the EU Ecolabel (amended by Commission Regulation (EU) No 782/2013 and Commission Regulation (EU) 2017/1941):

Products that are eligible for ecolabels may be more competitive. The list of licenced products can be found at the EU Ecolabel webpage[5]. While the most of categories might not be fit for the product produced in the local communities of the project, EU Ecolabel holiday accommodation might be a great option to apply for. There are other ecolabel types that can help market the product for the right target groups.

3.3. National legislation

All Member States have their legislative systems. During the data collection of this and other tasks in the projects several occasions were found where the differences between the countries came up. That poses challenge for the scaling up and reapplication of the activities, therefore knowledge of local rules and regulations have to be gathered when designing restoration and sustainable business activities. In this section three main areas are discussed for each of the Demo regions: water management, biodiversity and environmental impact assessment. The latter covers requirements on nature protection in a sense that if relevant to the investment impacts on biodiversity has to be included in the study. While gathering information about LEDs, the authors concluded that there are several areas where local regulations paint diverse pictures. Information on local circumstances are provided in the regional strategic documents chapter. However, it is strongly advised that before any investment or intervention, local authorities, including municipalities, are consulted, as each case requires an individual assessment.

- National legislative documents were looked up in original language using machine translation and large language models. As Moneus and Sahari (2024) pointed out, while AI translation systems may be faster and cost-effective, they might miss cultural or contextual nuances that a human translator would understand, providing more accurate understanding of legal texts. Therefore, the final text was reviewed by native speakers to avoid issues originating from this methodology.

Having an understanding of the EU legislation that was retrieved with the keyword query three topics of interest were identified: water and environmental impact assessment that covers the biodiversity.

5 TTPS://APP.POWERBI.COM/VIEW?R=EYJRIJOIMZAYMZVKNWMTNMJHOS00ZDG4LWIZMTITNZCZMDKWODBINJRMIIWID CI6IMIYNGM4YJA2LTUYMMMTNDZMZS05MDGWLTCWOTI2ZJHKZGRIMSISIMMIOJH9

3.3.1. Water

Knowing the regulation on water related issues is essential for DaWetRest demonstration site activities. The national laws are introduced in the order the Danube flows: Croatia, Bulgaria and Romania.

Croatia

Key regulations influencing the water management in Croatia[6] are the following:

Water Act (Zakon o vodama, NN 66/19, 84/21, 47/23): This act establishes the foundational principles for water management in Croatia, encompassing water abstraction, utilization, and protection. It enforces the polluter-pays principle and assigns responsibilities to water management authorities.

Regulation on Amendments to the Regulation on Water Quality Standards (Uredba o izmjenama i dopunama Uredbe o standardu kakvoće voda NN 20/2023, correction NN 50/2023) - This regulation provides information on the classification of Croatian water bodies according to their ecological and overall status to comply with the goals of the Water Framework Directive. Drava and Danube are categorised as lowland very large rivers (HR-R_5C and HR-R_5D).

Regulation on limit values for wastewater emissions (Pravilnik o graničnim vrijednostima emisija otpadnih voda NN 26/2020) - It specifies the permissible levels of pollutants in effluents discharged into water bodies and defines the obligations of wastewater treatment facilities. Generally speaking, the wastewater discharge threshold values for municipal and various industrial wastewater discharges are in alignment with the regulations of other European countries.

Regulation on Technical Requirements for Wastewater Drainage Structures, as well as Deadlines for Mandatory Inspection of the Correctness of Wastewater Drainage and Treatment Structures (Pravilnik o tehničkim zahtjevima za građevine odvodnje otpadnih voda, kao i rokovima obvezne kontrole ispravnosti građevina odvodnje i pročišćavanja otpadnih voda NN 3/2011, NN 9/2020) covers the technical requirements of different wastewater collection, storage and treatment infrastructure. For example, collection pits must be checked for water tightness during use in accordance with the standard Water supply - requirements for systems and parts of water storage systems HRN EN 1508.

6 HTTPS://WWW.ZAKON.HR/

Regulation of bathing water quality (Uredba o kakvoći vode za kupanje NN 51/2014) This regulation only considers the bathing water quality of terrestrial water bodies. The water quality has to be at minimum satisfactory.

The limit values for the main nutrients for surface water discharge are listed below. According to the **Decision on designation of sensitive areas** (Odluka o određivanju osjetljivih područja NN 79/2022) the Danube basin belongs to the sensitive category and the discharge of nitrogen and phosphorous must be limited and the decision does not define any 'less sensitive' area. That may be the main reason why nitrogen and phosphorous limit values are on the lower range compared to what the UWWTP allows.

- Biochemical Oxygen Demand (BOD5): ≤ 25 mg/L
- Chemical Oxygen Demand (COD): ≤ 125 mg/L
- Total Suspended Solids (TSS): ≤ 35 mg/L
- Ammonia Nitrogen (NH3-N): ≤ 10 mg/L
- Total nitrogen (TN) ≤ 15 mg/L and 10 mg N/l for plant greater than 100,000 PE)
- Total Phosphorus (TP): ≤ 2 mg/L (≤ 1 mg/L above 100,000 PE and for lakes)

Different limit values are in place for microbial indicators for terrestrial and coastal waters (e.g. Fecal Coliforms: ≤ 1000 CFU/100 mL for terrestrial surface waters). Additional to the list of inorganic pollutants such as aluminium or nickel, a detailed list of different pesticides is provided. This is different from other countries, for instance in the Hungarian legislation the latter is not included in the parameters that have to be controlled in the discharged wastewater. In both cases discharge values are provided and the physico-chemical parameters indicating the ecological status of the relevant water body is in a separate legislation, the connection between the water qualities of the treated wastewater and the recipient water body must be drawn on a case-by-case basis. Should the ecological status of the water bodied determine the effluent quality, assuming good status COD would have to be below 5.0-5.5 mgO_2/l, almost full nitrogen and phosphorous removal would be necessary (TN<2.4-3.0 mgN/l, TP<0.20-0.25 mgP/l) irrespective of the season.

In Croatia small abstractions and small wastewater discharges are exempt from controls. An environmental permit has to be obtained for any discharge of urban, industrial and other wastewater which prescribes the emission limit values, with the exception of rainwater and sanitary wastewater up to 50 population equivalents (PE)[7] or up to 10 PE, if the receiving watercourse is located in a protected area (see Water Act). Croatian legislation requires agglomerations between 2000-10000 PE to have wastewater treatment solutions since 2023 and

7 1 PE IS THE AMOUNT OF ORGANIC MATTER RELEASED BY ONE PERSON IN ONE DAY, EXPRESSED AS A FIVE-DAY BIOLOGICAL OXYGEN DEMAND AND EQUATES TO 60 GRAM OF BOD5 PER PERSON PER DAY

settlements with less than 2000 inhabitants are required to treat the wastewater in some suitable way but if building a public sewer system is not justified (by cost-effectiveness or environmental benefit) other means are allowed to treat the wastewater to an appropriate level before discharge into the receiving body. This includes individual collection and transport to regional wastewater treatment facilities. The regulation is subject to change in the near future when the suggested amendments of the Urban Wastewater Treatment Directive will be accepted, lowering the threshold to settlements of less than 1000 people.

There are generally binding rules for the control of diffuse pollution from agriculture, but the rules were applied only in Nitrate Vulnerable Zones. Some direct discharges to groundwater are authorised.

Bulgaria

Bulgaria's water and wastewater management framework[8] is highlighted in the next paragraphs.

Water Act (ЗАКОН за водите, SG No. 67/27.07.1999) - This law provides the overarching framework for water management in Bulgaria, specifically:

1. ensuring sufficient quantity and good quality of surface and underground water for sustainable, balanced and fair water use;
2. reduction of water pollution;
3. protection of surface and underground waters and the waters of the Black Sea;
4. ending the pollution of the marine environment with natural or synthetic substances;
5. reduction of discharges, emissions and discharges of priority substances;
6. cessation of discharges, emissions and discharges of priority hazardous substances;
7. prevention or reduction of harmful consequences for human life and health, the environment, cultural heritage and economic activity, related with the harmful effects of the waters.

Effluent quality standards in Bulgaria are established to protect the receiving water quality and mitigate the impact of wastewater discharge on aquatic ecosystems. Specific limit values for various pollutants are outlined in the **Regulation on emission standards for the permissible content of harmful and dangerous substances in wastewater discharged into water bodies** (Наредба за емисионни норми за допустимото съдържание на вредни и опасни вещества в отпадъчните води, зауствани във водни обекти, SG No. 6/9.11.2000). Discharge constraints for industrial wastewater is also discussed though in a slightly different structure that was

8 HTTPS://LEX.BG/BG

examined in the other countries' legislation. This regulation defines what areas are considered sensitive and less sensitive.

Ordinance on issuing permits for the discharge of wastewater into water bodies and determining the individual emission limits of point sources of pollution (Наредба за издаване на разрешителни за заустване на отпадъчни води във водни обекти и определяне на индивидуалните емисионни ограничения на точкови източници на замърсяване, No. 2/06.08.2011) – it provides rules for individual permitting of wastewater discharges.

Ordinance on the quality of water for irrigation of agricultural crops (за качеството на водите за напояване на земеделските култури SG No. 18/27.05.2009) is in force since 2009 and regulates irrigation in general, but Article 3 also discusses the option to use wastewater. Wastewater can be discharged in hydrotechnical facilities with the written consent of the owner given, that the wastewater meets the quality requirement for irrigation. Annex 1 of the ordinance contains the limit values. Table 4 lists the sanitation indicators. The total coli number given there corresponds to category A in the EU Regulation 2020/741 and the Escheria coli number to category B. Units were modified to align with the values in the EU regulation. The ordinance might have to undergo revision considering it does not contain the same categories but it is impressive that Bulgaria had rules on water reuse as early as 2009.

TABLE 4. SANITATION INDICATORS FOR IRRIGATION WATER QUALITY

Sanitation indicators		
Total coli titer	unit/100 ml	<10
Escherichia coli-titer	unit/100 ml	<100
Intestinal pathogens		not allowed
Microorganisms	unit/100 ml	not allowed

Romania

Key legislative documents[9] of Romania include:

Water Law (Legea apelor, 107/2006) and its amendments – This law provides the overarching framework for water management in Romania, including the protection and sustainable use of water resources. It states that water resources are of public interest, serving a multitude of purposes and are considered as strategic resource for national safety and security. The list of priority substances and main pollutants together with the categorisation requirements of water quality statuses can be found in this piece of legislation;

9 HTTPS://LEGISLATIE.JUST.RO/

Law on water supply and sewage service (Lege serviciului de alimentare cu apă şi de canalizareno. 241/2006) – this law creates the legal framework regarding the establishment, organization, management, financing, exploitation, monitoring and control of the provision of the public water supply and sewerage service of localities;

Government Decision for the approval of some rules regarding the conditions for discharging wastewater into the aquatic environment (HOTĂRÂRE pentru aprobarea unor norme privind condiţiile de descărcare în mediul acvatic a apelor uzate 188/2.28.2002) – Its amendments contain the limit values for discharge to sewer systems and surface waters. A non-exhaustive list of indicators are listed below:

- Biochemical Oxygen Demand (BOD_5): ≤ 25 mg/L
- Chemical Oxygen Demand (COD): ≤ 125 mg/L
- Total Suspended Solids (TSS): ≤ 35 mg/L
- Ammonium ≤3 mg /l (2mg/l for plants greater than 100,000 PE)
- Total nitrogen (TN) ≤ 15 mg/L and 10 mg N/l for plants greater than 100,000 PE
- Total Phosphorus (TP): ≤ 2 mg/L (≤ 1 mg/L above 100,000 PE)

The permissible concentration limits for various pollutants are similar to that other EU countries, except that the whole of Romania is categorised as sensitive therefor the limit values are relevant for all wastewater treatment plants with capacities higher than 10000 PE. According to the Action Plan listed within the decision, urban wastewater has to undergo tertiary treatment for agglomerations larger than 10,000 PE (deadline end of 2015) and secondary treatment for agglomerations between 2,000-10,000 PE.

Decision on Hygiene and Public Health Standards regarding the living environment of the population (Ordin pentru aprobarea Normelor de igienă și sănătate publică privind mediul de viață al populației, 119/2014)– provides regulation on individual wastewater collection and treatment. Buildings are required to have their own facilities for collecting, treating, and discharging wastewater, which shall be designed and operated so as not to cause soil, water, or air pollution. These can be septic tanks or individual treatment solutions but they have to be minimum 10 m away from the nearest dwelling and water source. According to the Decision 714/2022 (**Criteria for authorisation, construction, registration/registration, control, operation and maintenance of appropriate individual wastewater collection and treatment systems,** privind aprobarea criteriilor pentru autorizarea, construcția, înscrierea/înregistrarea, controlul, exploatarea și întreținerea sistemelor individuale adecvate de colectare și epurare a apelor uzate) individual systems have to get a permit for construction and operation. Discharge is allowed directly into surface water bodies or indirectly into underground water bodies, and monitoring of discharged water quality is required at least once a year.

3.3.2. Biodiversity and nature protection

Croatia

Key regulations influencing nature protection in Croatia[10] are the following

The **Nature Protection Act (Zakon o zaštiti prirode,** *NN 80/2013 15/18, 14/1927/19, 155/23***)**, is the main national law regulating nature and biodiversity protection in Croatia, including protected area categories, species protection, Natura 2000 implementation duties, requirement for management plans, permitting and sanctions. Article 25 regulates Acceptability Assessment (Ocjena prihvatljivosti) which is a specialized procedure for activities affecting the ecological network. Preliminary assessment has to be carried out to evaluate whether more detailed assessment (so called main assessment is needed. In this procedure the public interests that may override the acceptability concerns are also determined along with conditions to compensate the negative effects of the interventions. The Ministry is responsible for conducting the acceptability assessment for plans and interventions within the areas of national parks, nature park, and special reserve or if the intervention falls under the jurisdiction of the central government body. Otherwise the local governmental bodies oversee the process. As a rule of thumb, **any development or plan proposed within or near a protected or ecologically sensitive area triggers a complex legal assessment**, combining EIA requirements with specific acceptability procedures. Projects essential for managing ecological network areas are exempt from acceptability assessment, reflecting a balance between conservation needs and practical management. Details about the assessment process and requirements are listed in the Ordinance on the appropriate assessment of the plan, program and intervention for the ecological network (Pravilnik o ocjeni prihvatljivosti plana, programa i zahvata za ekološku mrežu, NN 118/2009).

The **National Biodiversity Strategy and Action Plan (**Strategiju i akcijski plan zaštite prirode republike hrvatske za razdoblje od 2017. do 2025. Godine, NN 72/2017**)**, outlines the key goals and actions for biodiversity conservation and sustainable use from 2017 to 2025. It highlights the main pressures on Croatia's natural resources, such as habitat loss, climate change, and invasive species, and presents 22 national targets across various themes, including protected areas, ecosystem services, sustainable agriculture, and public awareness. The **Decision on the adoption of the Financing Program of the Ecological Network Natura 2000,(**Odluku o donošenju programa financiranja ekološke mreže natura 2000, NN 54/2022**)**[11] specifically covers the freshwater habitats (rivers and lakes, E2.8 goal). At the time of preparing this deliverable, wetlands accounted for 0.24% of the total area and 0.6% of protected areas. The **Regulation on**

10 HTTPS://NARODNE-NOVINE.NN.HR /

11 https://narodne-novine.nn.hr/clanci/sluzbeni/2022_05_54_706.html

the ecological network and competences of public institutions for the management of ecological network areas (Uredba o ekološkoj mreži i nadležnostima javnih ustanova za upravljanje područjima ekološke mreže, NN 80/19, 119/23, 87/25) identifies and lists specific types of ecological network areas sets out the framework for creating management plans for the ecological network.

An updated list on further relevant legislation can be found on the Ministry of Environment and Green Transition webpage[12].

Bulgaria

The **Biodiversity Act** (Закон за биологичното разнообразие, SG No. 77/09/08/2002, last amended SG No. 88/20.10.2023) governs the conservation and sustainable use of Bulgaria's biological diversity. This includes protection of wild flora, fauna, fungi, and habitats, as well as the conservation of genetic resources of farm animals and agricultural plants. It establishes a framework for the management of protected areas, the regulation of activities that may impact biodiversity, and the control of trade in endangered species. There is a separate **Act on Protected Areas** (Закон за защитените територии**,** that establishes the categories, designation and management of protected areas (national parks, reserves, natural attractions, etc.). Both acts serve to transpose key European Union directives, such as the Habitats Directive and the Birds Directive

The Biodiversity Act often refers to environmental impact assessment which falls under the **Environmental Protection Act** (Закон за опазване на околната среда, SG No. 91/25/09/2002, last amendment is SG No. 70/20/08/2024, see next chapter) and the **acceptability assessment** which is **specific for Natura 2000 areas**. The former is to identify, describe, and assess the effects of a project on the environment in general and propose mitigation measures. The latter serves to assess whether the project will adversely affect the integrity of the Natura 2000 site and its conservation objectives. The legislation sets the standards for what constitutes an acceptable level of impact. Through the assessment the risks of destruction or significant disturbance of protected species, habitats, or the integrity of protected areas have to be determined and the intervention should not exceed said standards. The **Ordinance on the terms and conditions for carrying out an assessment of the compatibility of plans, programs, projects and investment proposals with the subject and objectives of protection of protected areas** (Наредба за условията и реда за извършване на оценка за съвместимостта на планове,

12 https://mzozt.gov.hr/o-ministarstvu-1065/djelokrug/uprava-za-zastitu-prirode-1180/zakoni-i-propisi-1224/1224

програми, проекти и инвестиционни предложения с предмета и целите на опазване на защитените зони, SG No. 201/31/08/2007, last amended SG No.106/15/12/2021) under Art. 31 of the Biodiversity Act gives details about the procedure for appropriate assessments in Natura 2000 sites and the specificities about when both acceptibility and environmental impact assessment is needed.

The Ministry of Environment and Water (MOEW) government page[13] provides national guidance documents, conventions and recommendations for impact assessment and site protection. The National Plan for the Protection of the Most Significant Wetlands in Bulgaria covers the 2013-2022 period[14] identifying key wetland sites. It set specific conservation and restoration objectives, and outlined concrete actions to protect their unique biodiversity, particularly for species and habitats of international importance, including Kalimok as potential Ramsar sites and other wetlands of national importance.

Romania

The principal national instrument governing protected areas, species protection and Natura 2000 implementation is the **Emergency ordinance looking at the regime of protected natural areas, conservation of natural habitats, flora and fauna** (Privind regimul ariilor naturale protejate, conservarea habitatelor naturale, a florei și faunei sălbatice **OUG nr. 57/2007,** approved and consolidated by **Law nr. 49/2011)**[15]. This act sets out protected-area categories, the legal regime for designation and administration of protected areas and species protection rules. It provides the framework to prepare and carry out protected area management plans, along with permitting and sanctioning powers. **Law 95/2016** establishes the National Agency for Natural Protected Areas (privind înființarea Agenției Naționale pentru Arii Naturale Protejate (ANANP) și pentru modificarea OUG nr.57/2007) responsible for the management plans.

Acceptability assessments are regulated by OUG 57/2007. Proposed plans, projects or interventions that may affect the integrity or conservation objectives of Natura 2000 sites must be screened and, where necessary, subject to an acceptability assessment. This procedure determines whether a detailed assessment of impacts on site integrity is necessary and—where adverse effects cannot be excluded—identifies mitigation, avoidance or compensatory measures required to ensure that the intervention does not adversely affect the conservation objectives of

[13] https://www.moew.government.bg/bg/priroda/zakonodatelstvo/rukovodstva-i-preporuki
[14] https://biodiversity.bg/files/modules/243/Lnq4-plan-bg-vlajni-664.pdf
[15] consolidated version https://legislatie.just.ro/Public/DetaliiDocument/83289

given protected area. The **Methodological Guide** approved by Ordinul no. 1,682/2023[16] provides useful information regarding the **appropriate assessment of the potential effects** of plans or projects on protected natural areas of community interest. It discusses the main steps of the process (screening, AA study, alternatives, compensatory measures) and provides checklists to aid the permitting procedure.

Romania prepared a Prioritised Action Framework (PAF) for Natura 2000 (2021–2027), government strategy for implementing Natura 2000, including measures, responsibilities, and financing needs. Consulting the framework allows insight on current and future nature protection strategies and decisions. E.2.3 chapter covers bogs, mires, fens and other wetlands and the measures prioritised in the period includes improving the conservation status of habitats and species and the ecological reconstruction of degraded wetlands, among others.

3.3.3. Environmental Impact assessment

Environmental impact assessment is an invaluable tool to identify and evaluate the potential effects of a development project thus aiding the decision making process. By providing various scenarios and comparing the respective impacts the best solution can be chosen (Duinker and Greig, 2007). Integrating social (Dendena and Corsi, 2015) and climate (Mayambe et al., 2023) change aspects in the assessment may provide a more comprehensive result on understanding the long term effects of a construction or development project.

Croatia

Whether a project has to undergo environmental impact assessment screening procedure is regulated by the **Decree on Environmental Impact Assessment** (Uredba o procjeni utjecaja zahvata na okoliš NN 64/2008, amended by NN 3/2017). Zagreb has special jurisdiction and requires screening of certain projects (detailed in Annex III of the decree) to decide whether environmental impact assessment is necessary but has to inform the relevant Ministries if another country is involved.

Three categories are distinguished: projects that must undergo the environmental impact assessment, projects that have to be screened to decide whether EIA is necessary and cases where the City of Zagreb is the competent authority. We only listed the project types that are in connection with the activities of DaWetRest or might become relevant in the upscaling and reapplication stages.

[16] https://legislatie.just.ro/public/DetaliiDocument/271901

Project types that must go through an environmental impact assessment (Annex I):

- Pumping underground water, other than water supply systems, or artificial refill projects groundwater with a capacity of 10,000,000 m³ per year or more.
- Transmission systems water resources between river basins are intended to prevent a possible shortage of water of water, where the amount of water transferred exceeds 100,000,000 m³ per year
- Reclamation systems with an area of 5,000 ha and more, and in the Adriatic catchment area 500 ha and more
- Dams and others buildings intended for the retention and accumulation of water, where the new or an additional amount of retained or accumulated water greater than 10,000,000 m³.
- Facilities for wastewater treatment with a capacity of 50,000 PE and larger with the associated drainage system.
- Marine fish farms in protected coastal areas (PCA)
    - white fish farms in the protected coastal area of the sea (POP) with an annual production of more than 100 t
    - fish farms outside ZOP, up to a distance of 1 Nm of annual production greater than 700 t
    - fish farms outside the ZOP, which are more than 1 Nm of annual production of more than 3,500 t from the coast of the island or the mainland
- Farms of bivalve molluscs in the PCA with an annual production of more than 400 t

Screening is needed whether environmental impact assessment is necessary (Annex II):

- Water management intended for agriculture, including irrigation and drainage in where the irrigation area is 2,000 ha or more, and in the Adriatic basin area of 300 ha or more
- Marine farms:
    - white fish farms in the PCA with an annual production of less than 100 t
    - fish farms outside the PCA of annual production greater than 100 t
- Groundwater abstraction or artificial groundwater replenishment programs
- Buildings for transfer of water between river basins
- Wastewater treatment plants with associated drainage system (no lower threshold)
- Freshwater ponds:
    - for salmonids per year production 10 t and larger
    - for cyprinids pond area 100 ha and larger
- Canals, embankments and other structures to defend against flooding and coastal erosion

Special rules for the jurisdiction of Zagreb, City of Zagreb is responsible (see Annex III)

"Art. 8.(1) On the request of the project holder for the assessment of the impact of the project on the environment, the competent The Authority shall inform the public and the interested public after determining that the request contains all the prescribed data and evidence and that the study contains all chapters in accordance with Annex IV to this Regulation."

Annex IV of the decree discusses the content requirements of an EIA study which has to include the impact on ecological network, should the intervention affect any Natura 2000 site. For smaller measures, the assessment with regards to nature conservation rules can be a stand-alone procedure, but for in the DaWetRest project the Middle Danube demonstration site will follow the EIAS procedure.

The Advisory Expert Committee evaluates the content and the compliance of the submitted request for EIA. The sessions of the Committee is public. The public is further involved in form of public hearings. They are also informed by the competent authority about the content and the decision regarding the project. Prior to the adoption of the decision, the draft decision shall be made available to the public by publication on the website of the competent authority for a period of 8 days.

Bulgaria

In principle, the environmental impact assessment is made according to 2 documents:

1. **Environmental Protection Act** (Закон за опазване на околната среда). Pron. State Gazette No. 91 of September 25, 2002 (SG No. 91/25/09/2002), its last amendment is SG No. 70/20/08/2024 and

2. **Regulation on the Conditions and Procedure for Performing an Environmental Impact Assessment** (Наредба за условията и реда за извършване на оценка на въздействието върху околната среда). State Gazette No. 59/03/07/2003, latest amendment SG No. 9/30/01/2024.

There are two distinct categories of project defined: those that are subject to the EIA and those that need to be screened to see whether an EIA is required. Annex I of the Act contains the list of projects that are obliged to go under EIA before commencing.

- Inland waterways and public transport ports which permit the passage of vessels of over 1,350 gross tonnes.
- Groundwater abstraction or artificial groundwater recharge schemes, where the annual volume of water abstracted or recharged is equal to or exceeds 10 million cubic metres.

- Works for the transfer of water resources between river basins where this transfer aims at preventing possible shortages of water and where the amount of water transferred exceeds 100 million cubic metres per year.
    - In all other cases – works for the transfer of water resources between river basins where the average annual (multi-annual average) flow of the basin of abstraction exceeds 2 000 million cubic metres/year and where the amount of water transferred exceeds 5 per cent of that flow.
- Wastewater treatment plants with a capacity exceeding 150,000 population equivalent.

Screening required whether EIA is necessary:

- water management projects for agriculture, including irrigation and land drainage projects;
- intensive fish farming;
- deep drillings for water supplies
- waste-water treatment plants that <150,000 PE
- sludge-deposition sites

In case of water related projects, i.e. investment proposals associated to surface or underground waters and plan to abstract or use the resources; discharge of wastewater or priority and/or hazardous substances, the relevant River Basin Directorate has to provide an opinion regarding the admissibility of the investment proposal. Similarly, the compatibility assessment with the Biodiversity Act (SG No. 77/9/08/2002) has to be conducted. Article 5(1) provides a list of legislation that has to be taken into consideration depending on the nature of the investment proposal.

The Article 5(2) states that the competent authority or an official authorized by it shall send a copy of the letter to the mayor of the respective municipality/municipalities, region/regions and town hall/town halls, of the respective basin directorate, the Executive Environment Agency and/or the Directorate of a national or natural park, and the affected public shall be notified by means of a message on its website. To gauge the interest of the public an additional communication channel has to be used to reach the public. However, the information has to be available for only 14 days, though may be longer.

On the other hand, the competent authority determines the interested parties and reaches out to them for consultation purposes. This may be done in the following ways as per Art.9 (3):

- announcement in the mass media;
- sending messages to local authorities;
- preparation and distribution of a prospectus or brochure with brief information about the investment proposal;

- distributing letters or questionnaires to interested organizations or persons living in the immediate vicinity, with a request for information and comments on the investment proposal;
- placement of information boards or posters;
- organization of expert or public groups on the scope of the assessment;
- organization of meetings with the affected population.

The timeframes set in the decree are short, 3 to 7 days for announcing and reacting, for example, written opinion of the municipalities, regions or mayoralties and request for another proposal of EIA has to be given in 7 days, however, the public hearing has to be minimum 30 days after that deadline.

The Lower Danube demonstration site has no major interventions, however the question of the floating ponton is to be decided. At the time of writing the deliverable the LD demo has to adhere to the rulings of the Protected Areas Act applies (SG No. 133/11/11/1998). According to it, only coordination is made for the activities that will be carried out on the territory of the protected area.

Romania

Environmental impact assessment is covered in **Government decision** no. 445 of 8 April 2009 **on the assessment of the impact of certain public and private projects on the environment** (Hotărâre privind evaluarea impactului anumitor proiecte publice și private asupra mediului). Similarly to the other countries' respective rules, the Romanian law distinguishes projects that due to their size or nature must go under EIA and others are screened in order to decide on the necessity of EIA.

In the first category the decision lists the following investment types among others:

- Inland waterways and river ports that ensure the traffic, respectively the operation of ships over 1,350 tons.
- Commercial ports, land-bound loading and unloading quays, and outer ports (excluding ferry quays) that allow vessels of at least 1,350 tonnes to operate.
- Groundwater catchment systems or artificial aquifer recharge systems, where the annual volume of water captured or recharged is at least 10 million cubic metres.
- Works for the transfer of water resources between river basins, conducted for the purpose of preventing water scarcity, for an annual volume of water transferred of at least 100 million cubic meters; the transfer of drinking water through pipes is excepted.
- In all other cases, works for the transfer of water resources between river basins, for an average multiannual flow of the catchment basin of at least 2,000 million cubic

meters/year and for a quantity of water transferred of at least 5% of this flow; the transfer of drinking water through pipes is excepted.

- Wastewater treatment plants of at least 150,000 equivalent inhabitants
- Dams and other facilities designed to retain or permanently store water, with a new or additional retained or stored water capacity of at least 10 million cubic metres.

Projects that undergo screening:

- water management projects for agriculture, including irrigation and dewatering projects
- intensive fish farms;
- the construction of roads, ports and port facilities, including fishing ports, other than those provided for in Annex no. 1;
- the construction of inland waterways, other than those provided for in Annex no. 1, sewerage works and flood works;
- dams and other installations designed for long-term water retention or storage, other than those provided for in Annex no. 1;
- long aqueduct installations (length not specified);
- works to combat coastal erosion and maritime works that may alter the coastal profile through the construction, for example, of breakwaters, quays, pontoons, piers or other marine defence works, excluding the maintenance and reconstruction of such works;
- groundwater extraction and artificial recharge of groundwater reserves, other than those provided for in Annex no. 1;
- works for the transfer of water resources between river basins, other than those provided for in Annex no. 1.
- wastewater treatment plants, other than those provided for in Annex no. 1;
- sites for the storage of sludge from wastewater treatment plants;

There are some instances in the screening category that have no lower limits (e.g. wastewater treatment plants) or the definition is not clear as it is the case for long aqueducts. This may cause confusion among those who are not local experts of EIA. Additionally, it increases the costs of small scale investments since regardless of the size they have to go through the process of screening to assess whether their environmental impact is substantial enough to carry out an EIA. **Order** no. 1.682 of June 14, 2023 **for the approval of the Methodological Guide on the appropriate assessment of the potential effects of plans or projects on protected natural areas of Community interest** (Ordin nr. 1.682 din 14 iunie 2023 pentru aprobarea Ghidului metodologic privind evaluarea adecvată a efectelor potențiale ale planurilor sau proiectelor asupra ariilor naturale protejate de interes comunitar) provides a guideline to follow the procedure of EIA.

The methodological guide[17] is more of a technical document and it takes the reader through the specific steps of the process.

The details and timeframe for the involvement of public is regulated in a separate legislation: **Government decision** no. 564 of 26 April 2006 **on the framework for achieving public participation in the development of certain plans and programmes in relation to the environment** (hotărâre privind cadrul de realizare a participării publicului la elaborarea anumitor planuri și programe în legătură cu mediul). Website of the competent authority, national and local newspapers, and signs headquarters of the local public authorities are mentioned as methods to reach out to the public. Posting the information has to be done 30 days prior to the public debate. The public and interested parties have to be able to comment on the proposal. Additionally, GD 445/8.4.2009 lists as potential media of communication: posters in the area where the interested public lives, exhibitions with plans, sketches, tables, graphs and models. It gives ideas of a more interactive reach out since the website post and news article are only one-way communication channels.

3.3.4. Connection between acceptability assessment and environmental impact assessment

Based on the findings on the two procedures of all three countries the similarities and differences were evaluated and are discussed in this chapter. Table 5 was generated considering the similarities among the countries.

The major differences in the procedures among the three countries are as follows:

- **Integration of AA and EIA:**
    - **Croatia:** AA and EIA are treated as two distinct, but related, procedures. A separate decision is issued for each.
    - **Romania:** AA is legally integrated into the EIA procedure. The AA study is a section within the EIA Report, and the conclusions are part of a single "Environmental Decision."
    - **Bulgaria:** The connection between AA and EIA is indicated but is considered as separate procedures with distinct reports and decisions.

[17] https://legislatie.just.ro/Public/DetaliiDocumentAfis/274906

TABLE 5. COMPARISON OF ACCEPTABILITY ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT

Step	Acceptability Assessment (AA)	Environmental Impact Assessment (EIA)
Scope	Project, plan potentially affecting Natura 2000 sites, assessment only covers the protected area.	Any project, plan that might have impact on the various environmental elements
Screening	An evaluation is performed to determine if the project is likely to have a significant impact on protected areas (Natura 2000 sites), i.e. if an AA is required.	An evaluation is performed to determine if a full EIA is required based on the project's characteristics, location, and potential impacts.
Assessment Report	A report is prepared that assesses the potential impacts on the protected area's integrity and conservation objectives.	A comprehensive report is prepared that includes a detailed analysis of environmental impacts on various components (e.g., air, water, soil, biodiversity).
Alternatives & Mitigation	The assessment must include an analysis of alternative solutions and measures to avoid or mitigate negative impacts.	The study must include an analysis of alternatives and proposed mitigation measures to reduce or eliminate significant negative effects.
Public Participation	The public and affected parties are given access to documentation and can submit comments.	Public participation is a mandatory and fundamental part of the process, which includes access to all relevant documents, public hearings, and the opportunity to submit comments.
Decision	The competent authority issues a decision or opinion based on the findings of the assessment.	The competent authority issues a final decision that approves or rejects the project, often with specific conditions for implementation.
Monitoring	Compliance with mitigation and compensation measures is monitored by the relevant authorities.	The conditions set out in the final decision are monitored throughout the project's construction and operation.

- **Treatment of Overriding Public Interest and Compensation:**
  - **Croatia:** Has a specific legal framework for "Imperative Reasons of Overriding Public Interest" (IROPI) and mandatory compensation measures for projects with significant negative impacts on Natura 2000 sites, even after mitigation.
  - **Romania & Bulgaria:** The IROPI and mandatory compensation framework for Natura 2000 sites are not formally mentioned as a distinct phase in the provided

text for their EIA procedures. While mitigation and compensation measures are required, there is no explicit mention of the "IROPI" concept as a separate legal step as there is in Croatia.

- **Decision-Making:**
  - **Croatia:** Separate decisions are issued for AA and EIA ("Decision on the Acceptability of the Intervention" and "Decision on Environmental Acceptability").
  - **Romania:** A single "Environmental Decision" is issued that covers both EIA and AA.

3.4. Regional strategic documents

A collection of relevant regional and local documents in the vicinity of the demonstration sites, pilot areas were curated. In all documents priorities, constraints and proposed measures related to nature protection and wetland restoration were identified and listed.

Croatia

Management plans in Croatia are mandatory documents, prepared for a period of ten years and the purpose is to provide solid foundation for managing protected areas and ecological network areas. The priorities, threats or pressures, and measures Management Plan for **Nature Park Kopački rit**[18] were identified. The main priorities include the conservation of strictly protected, endangered and target species (e.g. white-tailed eagle, black stork, wetland birds, fish species); protection and restoration of wetland habitats and hydrological regimes; conservation of forest ecosystems, particularly oak forests with old stands; sustainable management of fishponds and agricultural areas, balancing production with biodiversity; control and removal of invasive alien species; preservation of cultural heritage, traditional land use, and support to local communities; and strengthening cooperation with stakeholders, raising public awareness, and education.

The following threats and pressures have been identified:

- **Hydrology & Water Regime**: Altered water flows due to river regulation, melioration, drainage, and reduced groundwater levels.
- **Forestry**: Intensive forest exploitation, clear-cutting, monocultures, introduction of pests (e.g. oak lace bug *Corythucha arcuata*).
- **Fisheries & Water Pollution**: Fishpond mismanagement, nutrient runoff, eutrophication, pesticide input, wastewater discharges.
- **Invasive Species**: Expansion of alien fish, plants, and pests.

[18] https://pp-kopacki-rit.hr/wp-content/uploads/2023/10/20230927_PU008_cisto.pdf

- **Climate Change**: Increasing droughts, floods, extreme weather, heat waves, storms.
- **Agriculture**: Nutrient and organic matter runoff, sedimentation, disturbance from unsustainable practices.
- **Human Activities**: Illegal activities (poaching, disturbance, use of lead shot, unregulated tourism, sports fishing).

Measures to counteract threats and achieve priorities:

- **Species Monitoring & Protection**: Regular monitoring of eagles, storks, wetland birds; seasonal bans on human activity near nests; monitoring of fish populations.
- **Habitat Management**: Maintain water levels in fishponds, preserve wetland vegetation (reedbeds, sedges), restoration of oxbows, sediment monitoring, protection of spawning grounds.
- **Forestry**: Maintain share of oak stands >80 years old, prevent clear-cut monocultures, support natural regeneration.
- **Invasive Species Control**: Mapping, monitoring, active removal (plants, fish, pets), stakeholder education.
- **Agricultural Cooperation**: Establish buffer strips, maintain grasslands and pastures, promote autochthonous livestock breeds, avoid rodent poisoning.
- **Pollution Control**: Ban on lead ammunition, reduce pesticide and nutrient inputs, regulate wastewater discharges.
- **Awareness & Education**: Public campaigns, school programmes, training for farmers and fishpond managers.
- **Stakeholder Engagement**: Cooperation with landowners, farmers, fishers, hunters, local communities, and cross-border institutions.
- **Climate Adaptation**: Monitor groundwater, revise hydrological models, adapt management to extreme events.
- **Security & Law Enforcement**: Increase surveillance, technical protection systems, incident protocols.

The Management Plan for the **Danube River section near Vukovar**[19] (Plan upravljanja područjem ekološke mreže Dunav - Vukovar i pridruženim zaštićenim područjima, PU 009) was prepared based on the Guidelines for Planning the Management of Protected Areas and/or

[19] https://zastita-prirode-vsz.hr/wp-content/uploads/Plan-upravljanja-podrucjem-ekoloske-mreze-Dunav-Vukovar-i-pridruzenim-zasticenim-podrucjima.pdf

Ecological Network Areas[20]. For the Danube River section near Vukovar the following priorities were determined:

- Conservation and restoration of river habitats, including wetlands and floodplain forests.
- Protection of endangered and priority species.
- Sustainable water management to support ecological functions.
- Development of sustainable tourism and recreational activities.

The conservation and restoration efforts are hindered by various hydrological alterations due to river regulation and infrastructure. Current land uses and agricultural practices have negative impacts on the environment along with the presence of invasive species and pollution from human activities.

The management plan listed several measures to achieve the set goal and to counteract constraints:

- Restoration of natural river dynamics and habitats.
- Implementation of sustainable forestry and fishing practices.
- Raising awareness and educating the public about the importance of the area.
- Monitoring of species and habitats.

Another management plan of interest is for the **Sava ecological network area downstream of Hrušćica** (Plan upravljanja područjem ekološke mreže Sava nizvodno od Hrušćice[21]**).** The plan identified four priorities:

- Conservation of floodplain habitats, particularly alluvial forests and wetlands.
- Maintenance of the natural hydrological regime of the Sava River.
- Protection of key species, including migratory fish and birds.
- Sustainable use of natural resources in a way that does not harm biodiversity.

The main threats and pressures in the Spačva Basin are similar to those in the Vukovar region. The **Spačva Basin[22]** is known for its unique Spačva forest complex, including oak and hornbeam forests. Their focus is to protect these forests by maintaining and improving the hydrological balance of the basin.

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[20] https://www.haop.hr/sites/default/files/uploads/inline-files/Smjernice%20za%20planiranje%20upravljanja%20MINGOR%201120_0.pdf

[21] https://zastita-prirode-vsz.hr/wp-content/uploads/Plan-upravljanja-podrucjem-ekoloske-mreze-Sava-nizvodno-od-Hruscice.pdf

[22] https://zastita-prirode-vsz.hr/wp-content/uploads/Plan-upravljanja-podrucjima-ekoloske-mreze-i-zasticenim-podrucjima-Spacvanskog-bazena.pdf

Current forest management practices include large-scale clear-cutting and intensive regeneration on short rotations which results in lack of balanced age structure in forests as well. Hydro-technical works alter water regime (canals, dams, embankments), prolonged flooding and waterlogging in low areas damage floodplain forests while oak forests are prone to drying due to low groundwater levels which leads to higher susceptibility to pests and pathogens. Habitats of sensitive bird species (black stork, lesser spotted eagle, woodpeckers) are disturbed by forestry, hunting, and recreation while construction of roads and other infrastructure fragment habitats. Some of the answers to these threats and pressures in the management plan is listed here:

- Controlling invasive species, use of biological/biotechnical methods for pest control.
- Sustainable management of water resources, such as ensuring the connection between oxbow lakes and the river, prevent natural succession of stagnant waters, and maintain at least 5 m of **riparian vegetation** along water bodies
- Enhancing protection of specific habitats and species (leave dead wood and hollow trees for cavity-nesting birds, preserve fruit trees).
- Monitoring the state of nature and effectiveness of measures.

The **Development Plan of Osijek-Baranja County** (Plan razvoja Osječko-baranjske županije za razdoblje do 2027. godine)[23] has a broader scope, covering development priorities such as economic development through sustainable tourism, agriculture, and industry; improvement of infrastructure, including transport and water management systems.; Environmental protection and resource management; and digital transformation and innovation. With regards to the scope of the project, the following key issues were identified in the document:

- **Climate change and hydrological extremes** – Increasing frequency of floods and droughts directly threatens wetland ecosystems (e.g. Kopački Rit) and water availability for both nature and agriculture.
- **Water infrastructure deficits** – Outdated or incomplete water supply and wastewater systems, coupled with insufficient treatment capacity, create risks of pollution entering rivers and wetlands.
- **Pollution and nutrient run-off** – Agricultural intensification, inadequate sewage treatment, and waste mismanagement lead to eutrophication and degradation of wetland and river habitats.
- **Land-use conflicts** – Expansion of intensive farming, infrastructure, and settlements creates pressures on protected wetland areas, reducing natural retention and biodiversity.

[23] https://www.obz.hr/index.php/plan-razvoja-osjecko-baranjske-zupanije-do-2027-godine

- **Biodiversity vulnerability** – Natura 2000 areas and the Kopački Rit Nature Park are extremely sensitive to human disturbance and require active protection and ecological monitoring.
- **Governance and adaptation gaps** – Although measures are planned, implementation challenges (legal barriers, centralised management, funding delays) slow down integrated water and wetland management.

Additionally, the development programs of the municipalities in the vicinity of the demonstration areas were studied. Key findings are found in Table 6.

TABLE 6. LIST OF LOCAL DEVELOPMENT PLANS AND THE PRIORITIES, CONSTRAINTS AND SOLUTIONS IN THE MIDDLE DANUBE AREA

Municipality	Document	Main Priorities	Constraints	Solutions
Bilje (incl. Kopački Rit)	Strateški Razvojni Program Općine Bilje	• Natura 2000 & Kopački Rit protection • Nature-based/ecotourism • Sustainable agriculture & irrigation • Flood management	• Flood risks from Danube & Drava • Restrictions from Natura 2000 • Limited local funding	• Legal: strict Natura 2000 compliance, integration into spatial plans • Technical: green infrastructure for flood retention, irrigation systems • Economic: EU Cohesion & Rural Development funds, tourism diversification
Draž	Provedbeni Program Općine Draž za razdoblje 2021 - 2025	• Sustainable fishery & aquaculture• Danube flood management• Rural & eco-tourism• Biodiversity & wetland protection	• Outmigration & ageing population • Inadequate water protection infrastructure • Agricultural pressure on wetlands	• Legal: harmonisation with Water Act & Natura 2000 • Technical: embankment upgrades, wastewater improvements • Economic: EU grants for fishery, eco-tourism, cross-border cooperation with Hungary/Serbia
Erdut	Plan razvoja Općine Erdut do 2030	• Protection of Danube riverbanks• Development of wine & nature-based tourism• Water supply and irrigation• Cross-border Danube cooperation	• Erosion & flood risks • Lack of wastewater treatment • Low investment capacity	• Legal: alignment with Danube Transnational Programme & Natura 2000 • Technical: modern irrigation, small WWTPs • Economic: Interreg & IPA funds for tourism/water infrastructure
Petlovac	Provedbeni Program Općine Petlovac za razdoblje 2021-2025	• Agricultural sustainability • Groundwater & soil protection • Wetland preservation (Baranja corridor) • Tourism diversification	• Low municipal revenue • Pressure from intensive farming • Lack of water monitoring	• Legal: stricter enforcement of environmental protection • Technical: soil-friendly agriculture, monitoring stations • Economic: subsidies for eco-agriculture, EU CAP measures

Other documents of interest with regards to the pilot and sibling sites of the projects are the **Law on Nature Protection** of the **Federation of Bosnia and Herzegovina,** and the **Management plan for Obedska Bara (Serbia).**

Bulgaria

A key document for identifying key pressures in the Bulgarian DEMO area is **National Strategy for Management and Development of the Water Sector in Bulgaria** (Националната стратегия за управление и развитие на водния сектор, 2012)[24]. Its action plan contains long-term (2022-2037) measures concerning water infrastructure, services, and investment needs. The strategy focuses more on the urban side of the integrated water management while the **River basin management plan in Danube region (2022-2027)[25]** on the Bulgarian section of the Danube Basin identifies pressures on water bodies, monitoring data, environmental objectives, and programmes of measures on a national level. Since the Danube river basin management plan was covered in chapter 3.1.2, this document is not discussed in detail. For reapplication sites the RBMP of the **Black Sea Region** might be of interest. For instance, raising the water level of surface and groundwater in territories occupied by coastal water-dependent natural habitats are mentioned for the Sredetska Reka river.

While there is no updated version of the management plan[26] of the Kalimok–Brushlen protected area, the management plan for 2006-2016 period provides some useful information on the geography, hydrology, biodiversity, and socio-economic aspects of the protected wetland area. Teh main priorities mentioned are the restoration and preservation of biodiversity and other natural assets including restoring significant species and natural habitats and increasing the area of floodplain forests; Sustainable management of restored wetlands and water, ultimately achieving a "good state" of the waters and to encourage private owners and users of natural resources to adopt more sustainable and environmentally friendly practices. Zoning was introduced for differentiating protection regimes and restricting access to areas with important conservation species. The **Prioritised Action Framework (PAF) for Natura 2000[27]** covers the 2021–2027 era and provides a financing framework for ecological networks in Bulgaria. It identifies priority measures, funding needs, monitoring requirements, administrative costs, and communication

[24] https://www.moew.government.bg/bg/vodi/strategicheski-dokumenti/nacionalna-strategiya-za-upravlenie-i-razvitie-na-vodniya-sektor-v-republika-bulgariya

[25] https://www.bd-dunav.bg/content/upravlenie-na-vodite/plan-za-upravlenie-na-rechniia-baseyn/purb-2022-2027-v-dunavski-rayon/proekt-na-purb-2022-2027-v-dunavski-rayon

[26] https://www.moew.government.bg/bg/priroda/zastiteni-teritorii/planove-za-upravlenie-na-zastiteni-teritorii-vlezli-v-sila/zastiteni-mestnosti-i-prirodni-zabelejitelnosti

[27] https://www.eufunds.bg/sites/default/files/uploads/eip/docs/2022-02/PAF_Draft%20Final_2.pdf

activities focused on ecosystems, freshwater habitats, species conservation, and governance needs. The document mentions Srebarna nature reserve and the Rusenski Lom Nature Park in the conservation and restoration efforts. Another document to be consulted when planning restoration efforts is **National Climate Change Adaptation Strategy to 2030**[28]**.** It provides cross-sectoral analysis of climate risks and vulnerabilities. Education, awareness raising are key priorities in the action plans besides adequate planning and funding of activities that aid climate mitigation activities. Action plans for different sectors, including biodiversity and nature protection and water sector are in Annex 3.

The municipal strategic documents follow the same framing sharing three common pillars: economic development, social policy, and environmental sustainability. There was a recurrent theme in the identified threats: demographic decline, ageing, limited municipal finance, and vulnerabilities tied to water and wastewater infrastructure were mentioned. The risk of the Danube flooding for riverside municipalities was also dominant. Measures repeatedly emphasise water supply and sewerage investments, flood risk reduction, administrative capacity building, and targeted economic measures such as agri-modernisation and tourism. Table 7 contains the summary of the management plans of the municipalities in the region.

TABLE 7. LIST OF LOCAL DEVELOPMENT PLANS AND THE PRIORITIES, CONSTRAINTS AND SOLUTIONS IN THE LOWER DANUBE AREA

Municipality	Priorities	Constraints	Proposed Measures
Ruse PIRO – Ruse	• Urban regeneration, port/logistics growth • Water/sewer upgrades (significant losses from the municipal water network, and a lack of proper drainage systems) • Climate adaptation & Danube flood protection (Danube River and the Rusenski Lom)	• Ageing water/sewer infrastructure • High capital needs vs. local resources • Multi-stakeholder coordination (port, protected areas)	• EU/national-funded sewer/WWTP upgrades • Riverbank protection & floodplain measures: cleaning riverbeds, constructing protective facilities • PPPs for logistics & Danube tourism • Conservation and restoration of ecosystems and biodiversity
Slivo Pole PIRO – Slivo Pole	• Floodplain & Danube riverfront management • Port/transport infrastructure • Water/sewer upgrades • Economic uplift, modernisation Cultural heritage	• Flood risk requiring multi-agency response • Low local technical/financial capacity • Fragmented or outdated infrastructure network	• National/EU co-funded flood & port projects • Strengthen riverbank maintenance & management •Investment in water supply and sewerage networks
Tutrakan PIRO - Tutrakan	• Strengthening local economy (agriculture, agro-	• Natural constraints: flood-prone areas and limited internal surface waters	• Targeted infrastructure investment

[28] https://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=1294

Municipality	Priorities	Constraints	Proposed Measures
	processing and Danube tourism) • Infrastructure development (water & sewer, transport links, digital connectivity). • Sustainable use of Danube river resources; cultural heritage protection. • Climate change mitigation and adaptation.	outside the Danube shoreline • Aging infrastructure, limited capacity • Environmental pressures - agricultural activities • Peripheralisation • Capacity limits to prepare and implement larger EU projects	sustainable tourism - Danube-side assets and cultural heritage • Emergency planning and flood risk mitigation measures
Sitovo PIRO - Sitovo	• Improve infrastructure • Integrated, place-based interventions • Protect biodiversity and cultural heritage	• Budget and capacity issues • Limited investment • Outmigration	• Improve infrastructure • Targeted support for local • SMEs/agriculture • Climate adaptation measures
Vetovo PIRO – Vetovo	• Protect Rusenski Lom/Beli Lom biodiversity • Support tourism & agriculture	• Lacking sewerage & WWTP in many towns • Dependence on EU/national funding	• Construct sewer networks & WWTPs >2,000 PE[29] • Replace water mains • Eco-tourism infrastructure
Silistra PIRO - Silistra	• Economic development and investment attraction • Improving municipal services; • Environmental protection and flood risk management; • Connectivity and transport	• Flood risk • Financial and administrative capacity; • Legacy infrastructure deficits; • Need to coordinate across municipalities and with regional strategies	• Infrastructure programmes • Climate adaptation measures, • Stimulate investment and tourism, • Improve administrative capacity and project pipeline
Ivanovo PIRO – Ivanovo	• Conservation of Rusenski Lom & sustainable tourism • Infrastructure (water, roads) • Cultural heritage valorisation	• Conflict between conservation rules & development • Costly environmental assessments for projects	• Visitor/tourism projects compliant with Natura2000 • EU-funded infrastructure upgrades • Capacity building for environmental management

Romania

The **Danube Delta Integrated Sustainable Development Strategy** (Strategia Integrată de Dezvoltare Durabilă a Deltei Dunării)[30] was developed to balance biodiversity conservation with socio-economic development in the Danube Delta, acknowledging that it is one of the most sensitive ecological regions in Europe. It sets out a vision of the Delta as a "living delta" where people coexist in harmony with nature, supported by sustainable economic activities in **tourism, fisheries, aquaculture, and agriculture**, underpinned by improved connectivity and public services. The strategy is structured into **five main pillars:**

1. Environmental protection and resource management: Biodiversity conservation, ecosystem management, climate change adaptation, disaster risk management, and energy efficiency

[29] Current plan refers to >2000 PE but the new UWWTD will require wastewater collection for settlements >1000 PE

[30] https://assets.itideltadunarii.com/PortalAssets/Fisiere/DocumenteUtile/SIDDDD%20HG%206022016.pdf

2. Economic development: Sustainable tourism, modernised and eco-friendly fishing and aquaculture, diversified rural economy, and value-added agriculture
3. Connectivity: Transport infrastructure adapted to deltaic conditions, improved digital infrastructure, and environmentally sensitive mobility solutions
4. Public services: Water supply and sanitation, waste management, healthcare, education, social inclusion
5. Governance and institutional capacity: Strengthening administrative capacity, efficiency of local institutions, stakeholder engagement, and integrated programme management

The strategy identified several constraints in achieving its goals, one of them being the strict EU and national regulations (Birds & Habitats Directives, UNESCO Biosphere Reserve status). Weak coordination across sectors and limited technical knowledge for sustainable resource use and eco-tourism were also listed. Others are similar to the Bulgarian constraint: low institutional and financial capacity, poor infrastructure, demographic decline and limited human capital.

The strategy proposes interventions tailored to each pillar:

- Environment: Ecological restoration, hydrological modelling, dredging and de-silting, flood protection, monitoring systems, renewable energy, and institutional strengthening.
- Economy: Develop eco-tourism and cultural tourism (guided by local traditions), modernise fisheries and aquaculture, support small-scale farmers, promote local products.
- Connectivity: Improve river and road transport, expand ICT networks, develop sustainable mobility (cycling, eco-boats).
- Public Services: Upgrade water and wastewater systems, improve waste management, modernise healthcare and education facilities, enhance social inclusion.
- Governance: Performance-based management, de-bureaucratisation, stronger local capacity, public-private partnerships, monitoring and evaluation systems.

The connection between the proposed measures and the DaWetRest objectives and tasks are undeniably clear, which shows that the partners were aware of the strategic needs of the region. The **Report on the analysis of a local development strategy: Danube Delta Integrated Sustainable Development Strategy** (2030)[31] discusses both achievements and shortcomings. On the positive side, the strategy has mobilised a significant volume of resources and raised awareness of sustainability in the Delta. However, the evaluation also finds that the complexity of the strategy, combined with weak monitoring and evaluation systems, has made it difficult to track

31 https://documents1.worldbank.org/curated/en/099060223123016761/pdf/P17282009ebd3601b0a3450538fa5264fb5.pdf

results and ensure effective implementation. The report emphasises the need for clearer baselines, more coherent indicators, and stronger institutional arrangements.

Additional information can be found in the **Romanian National River Basin Management Plan** (2021-2027). A total number of 20,202 potentially significant pressures were identified in the updated National Management Plan. These can be categorised into three major groups:

- **Pollution**
  - organic substances: wastewater discharge, especially from untreated sources.
  - nutrients: from agriculture and other sources- eutrophication.
  - priority/hazardous substances: industrial and other sources - accumulation.
- **Deterioration**
  - hydro-morphological conditions: alterations to the river's flow, such as dredging for navigation or canalization.
  - groundwater quality: pollution from urban, industrial and agricultural sources.
- **Climate change:** rising sea levels - saltwater intrusion, changes in water flow (floods or droughts), and altered temperature regimes.

To address these issues, the plan proposes a joint programme of measures. These include upgrading wastewater treatment, improving agricultural practices to reduce nutrient runoff, controlling hazardous substances, restoring river habitats, and preparing for the effects of climate change. The plan underscores the importance of cross-border cooperation, stakeholder engagement, and public participation to ensure successful implementation. Similar issues and solutions are set in the revised **EU Strategy for the Danube Region**[32]. Additionally the strategy aims to strengthen territorial cohesion various levels, including river-section levels. The **Nautical Mobility Plan in the Danube Delta (Plan de Mobilitate Navală în Delta Dunării)**[33] is a long-term strategic plan for improving waterborne transport in the Danube Delta. It addresses accessibility for isolated communities, sustainable tourism, fishing activities, and integration of transport planning with environmental protection and cultural identity. To achieve this several constraints have to be overcome both from legal and technical point of view. The document points out the need for coordination across multiple jurisdictions (local, regional, national). Interventions should meet minimum safety and environmental standards, and feasibility studies and environmental impact assessments should be prepared before projects. The mobility plan proposed to develop defined and regulated **navigation corridors** to streamline access while minimizing habitat

[32] https://danube-region.eu/wp-content/uploads/2019/12/EUSDR_Consolidated-Input-Document_AP-Revision_2019.pdf

[33] https://ddbra.ro/wp-content/uploads/2021/05/PLAN-DE-MOBILITATE-NAVALA-DELTA-DUNARII.pdf

damage and to create designated maintenance zones and scheduling to reduce disturbance during sensitive habitat seasons.

On a truly regional level, the **Sustainable Development Strategy of Tulcea County 2021–2027** (Strategia de dezvoltare durabilă a Județului Tulcea)[34] provides framework for socio-economic development in the Danube Delta Demonstration area. Developed by the County Council of Tulcea, this strategy frames its approach around regional cohesion with European, national, and local policies. The document names seven strategic objectives:

1. Improve accessibility and connectivity of Tulcea to European networks.
2. Stimulate economic growth and competitiveness through innovation, agro-food, aquaculture, and tourism.
3. Ensure sustainable management of natural resources and reduce disaster risks.
4. Develop agriculture and fisheries infrastructure.
5. Increase quality of life and equitable access to education, healthcare, social and cultural services.
6. Develop sustainable tourism while protecting the environment.
7. Strengthen governance, partnerships, and cross-border cooperation.

The County of Tulcea suffers from geographic isolation and infrastructural gaps which partially led to population decline and social disparities between urban and rural areas. Local economy is dependent on primary sectors such as agriculture, fisheries which are threatened by climate change risks and natural hazards (flooding, erosion and the overall environmental fragility of the Danube Delta.

One of the constraints is achieving the aforementioned objectives are that projects in the area heavily rely on outside sources such as EU funds. Local authorities in the region have limited administrative capacities while any development has to be balanced with environmental conservation efforts.

In order to offset these constraints and pressures the following measures are defined in the sustainable development plan of Tulcea County:

- Investment in smart and green infrastructure (bridges, ports, digitalisation).
- Supporting innovation in agriculture, aquaculture, and tourism.
- Expanding renewable energy and energy efficiency.

34 https://assets.cjtulcea.ro/Sectiunea%20Despre%20Institutie/Programe%20si%20strategii/SRATEGIA%20DE%20DEZVOLTARE%20DURABILĂ%20A%20JUDEȚULUI%20TULCEA%202021-2027.pdf

- Improving education, healthcare, and social inclusion programmes.
- Promoting sustainable tourism with branding and cultural heritage protection.
- Building public-private partnerships and EU-funded projects.
- Strengthening administrative efficiency and citizen participation.

Table 8 gives an overview of some of municipalities' development plans. Common themes across the studied municipality development strategies were identified: (a) wastewater / sanitation upgrades; (b) protection of reedbeds, fish spawning grounds and Natura 2000 habitats; (c) sustainable / low-impact tourism as a growth path; (d) maintenance of waterways, ports and waterborne access while seeking to reduce habitat damage; (e) resilience to coastal erosion and flooding (shoreline dynamics). These themes are present in the integrated Delta strategy (national/ITI) and repeatedly appear in municipal SDLs. When framing recommendations or evaluating feasibility of Delta municipal strategies, the most critical barriers to account for are:

- **logistical cost and technical feasibility** of water/wastewater systems in remote, flood-prone villages; some of the communes are only reachable by boat;
- **stringent conservation restrictions** that limit interventions: Any infrastructure or tourism project must pass AA assessments and often EIA;
- **institutional and financial capacity limits** of small rural councils;
- **socio-economic fragility** (outmigration, low revenues) that undermines long-term sustainability.

These barriers mean that local priorities (tourism, sanitation, biodiversity protection) often require regional or national coordination (through ARBDD, Tulcea County, ITI programmes) rather than being solvable by the municipalities alone. The process involves multiple actors, and coordination is often slow and bureaucratic in certain parts of the Danube Delta, hydrology and fisheries management depend partly on Ukraine, beyond local control.

Additionally, fishing restriction and local economic reliance on fisheries create and interest clash. Fishers face seasonal bans and quotas, limiting opportunities for growth in line with traditional livelihoods.

TABLE 8. LIST OF LOCAL DEVELOPMENT PLANS AND THE PRIORITIES, CONSTRAINTS AND SOLUTIONS IN THE LOWER DANUBE AREA

Municipality	Priorities	Constraints	Proposed Measures
Tulcea	• Green/blue infrastructure, Urban–Delta interface, • Improved wastewater treatment and urban sanitation to prevent nutrient and pollution flows into the Delta • Governance strengthening. • Sustainable tourism & cultural heritage linked to Delta conservation	• Multi-stakeholder governance complexity, high infrastructure cost, nutrient load.	• Coordination & Monitoring Committee and dedicated technical secretariat for strategic implementation. • Multi-criteria prioritisation framework for projects (including environmental, economic, funding feasibility). • Institutional restructuring to centralise strategic planning and grant/project management capacity
Sfântu Gheorghe 2023-2030	• Improving the quality of life, economic opportunities, and combating poverty and unemployment • Coastal dynamics & beach management • Protecting coastal & lagoon habitats and complying with reserve restrictions • Local infrastructure resilience (roads, access, utilities) to prevent fragmentation of natural areas and to cope with flooding/erosion	• Challenges related to the quality of life, energy and climate, economy, urban development, mobility, and social issues	• Modernizing and extending road networks, sidewalks, and parking lots. • Building bicycle lanes. • Sustainable tourism linked to conservation • Adaptation to shifting shoreline
Chilia Veche	• Sustainable livelihoods: small-scale fishing and reed processing • Riparian habitat protection & floodplain management • Harmonizing agricultural and non-agricultural economic components	• Low number of agricultural machines in private households. • Difficulties in local producers' association initiatives. • Lack of local agri-food market. • Lack of social enterprises.	• Public awareness campaign about the causes and effects of climate change • Improving infrastructure to reduce diffuse pollution
Mahmudia	• Aligned with the objectives of the National Sustainable Development Strategy 2030 • Wetland conservation & management of lagoon / lake systems	• Lack of funding • Administrative capacity limits • Lack of consultation with all interested parties	• Improving education, infrastructure (water& wastewater) and public safety • Sustainable tourism and fish processing support as economic diversification

Municipality	Priorities	Constraints	Proposed Measures
	• Focus on education and infrastructure		compatible with conservation.
Sulina 2018-2035	• Improving access to services. • Promoting investments in the business environment • Coastal protection & erosion control • Sustainable tourism - natural heritage, low-impact facilities	• Lack of a waste management system • Local co-financing of projects • Funding of ineligible expenses	• Increase the tourism potential: rehabilitating historical monuments and reviving traditions and crafts. • Water supply, sanitation and sewage infrastructure upgrades • Accessing EU funds.
Murighiol	• Improving energy efficiency for schools and building cultural centres • Integrated management of lagoons and fish resources •Flood & water level management	Document covers 2018-2023 lack of a market	• Energy efficiency measures • Infrastructure to support ecotourism while limiting impacts (boat channels, visitor information, waste management)

4. Discussion

When the workflow of the T2.3 was designed, it was decided that text mining and large language models should be utilised for the task. The intention was to remove human error in the data collection and interpretation process; however, the full automation of the analysis was not possible. This is in alignment with the general suggestion on the use of any AI or LLM tools. Several text-mining methods were tested, some could identify the surrounding of a keyword, but the text still had to interpreted by a human expert. The way this method worked was similar to diagonal reading which can be assisted by keyword search within the document. However, when a large number of documents have to be processed, the code that identified the keyword frequencies was useful in directing the attention to those files that had several of the keywords or a vast number of one specific keyword. The sentiment analysis was less of a help regarding the legislations but was interesting to see how the different strategic documents were phrased. The language was neutral for legislative works and slightly on the positive side for the strategies/missions. Results are not included in the deliverable as they do not add to the framework but will be useful for later documents to check whether the language is objectively in the intended range. Similarity analysis was the most as it helped identify the duplication of documents as well as the different versions of consolidated legislation. When downloading the consolidated version of a modified law, the versions for different modifications were not identical, and the filename was different. The similarity analysis helped find the overlapping documents that was overlooked during the file collection and this way they were out ruled before the human expert.

Other text-mining methods were tested and ruled out as they were did not provide additional information to the scope of deliverable. LLM (ChatGPT) was only used to assist the writing team's work in summarizing the contents of larger documents, translation from local languages and improvement of writing style. However, the answers were double checked and overruled if found inaccurate or overly general. Legislation documents were processed by using keyword search and zigzag reading style instead of relying on LLM. The overall conclusion of machine assisted text processing was that text that require precise understanding, and details of information can be crucial, text-mining cannot be fully relied on. For instance, the critical review of strategic documents and understanding the legally binding text of EU and national rules require an expert's oversight.

As was mentioned in chapter 3.1.1 the Mission Ocean and Waters concentrates more on the marine waters compared to freshwater environment. Counting the mentions of the Lighthouse names, Danube appears 8 times, Black Sea 4 times, the Mediterranean are used on 28 occasions, 11 if the word 'sea' is added. Atlantic, Arctic, Baltic and 'North Sea' are mentioned 13 21, 14 and 6 times, respectively. Keyword search for river and sea gave 36 and 98 results. Three of the four

Lighthouses focus on seas and the ocean and in the upscaling stage Blue Parks program is introduced as the expansion of networks of marine protected areas. However, the target of the Mission to restore at least 25,000 km of free-flowing rivers, and the Danube River basing has a total of 29,127 km, 44% of which belongs to the heavily modified water category. This suggest that this goal cannot be allocated to one single river basin. Fortunately the all Lighthouses can contribute to all defined target values. And the total length of rivers withing EU territory is 1.7 million km[35]

In the Danube River Basin (ICPDR, 2021) 15.5% of the total length of water bodies do not have data on their ecological status and 12% when considering chemical status. The results are considerably worse if priority substances in biota are used as markers, there is no information for 56.5% in 2021. Substantial effort went into monitoring programs to gain a solid understanding of the water quality but the inclusion of priority substance posed the Member States with the challenges to invest in analytical instrumentation and to develop or implement methodologies that are not straightforward in their monitoring programs. The expectation of the Mission to utilise already existing infrastructures in monitoring the aquatic environment it aims to restore is understandable but for the purposes of monitoring the effects of wetland restoration, higher resolution of data would be necessary with adequately frequent sampling that is consistent and can be run long term. However, the costs of these activities are high and the benefits are difficult to monetize therefore the vital information for a robust digital knowledge system, let alone a digital twin of a similar scale are arduous to retrieve.

The management of data collection and efficient use could be an adequate task for the Lighthouses. However, the current available information on the goals and activities of the four lighthouses are overly general. In some cases, their website gave the impression that a lighthouse was the “storefront” of their respective CSA project and each page had a vastly different approach. In contrast, the soil living labs and lighthouses can be found in one place[36] and a map helps navigate the reader between the numerous initiatives.

Chapter 3.2 showed that even with the careful choice of keywords the queries could result in irrelevant information. However, opting for the expression ‘environmental impact assessment’ would have omitted several relevant legislation because they do not appear in them. The EUROVOC descriptors could have been another route but deciding on the suitable words would have required going through the full list of descriptors. They may be useful for a further analysis

[35] https://www.eea.europa.eu/data-and-maps/dashboards/wise-wfd
[36] https://prepsoil.eu/living-labs-and-lighthouses/map

of legislation by combing through the expression that were retrieved with the current search campaign.

The sub-chapter titles follow the keywords only loosely. For instance, a new category, local economic development was brought in because it described the topic of the legislation better than soil would have despite being closely connected to it. It is worth mentioning that LED was considered as a classifier in the grouping of the strategic documents.

The Croatian legislation covers the topic of EIA in a decree, while the Bulgarian defines the activities in the Environmental Protection Act along with some general provisions and the methodology is described in a decree. The webpage[37] of the ministry of Environment and Water in Bulgaria collects the legislation under the Ministry's jurisdiction by topic and with each topic the relevant guidelines and reports are provided which is of immense help for people trying to familiarize with the requirement. Romania has the most complex regulation, there are different laws that refer to the need of EIA, one provides a general overview, a separate covers the involvement of the public and a third approved the methodological guide for EIA.

Most of the items for projects subject to EIA or screening are the same in all laws discussed in this study but local differences do appear. One of the major differences among the three legislation that while the Croatian has lower limits of size defined for certain project type the Bulgarian and the Romanian forewent that. For example a wastewater treatment plant below 10,000 PE does not have to apply for screening in Croatia but both in Bulgaria and Romania the contracting authority has to carry out the screening.

Using the example of the V4 countries (Gałaś et al., 2015) potential shortcomings of the procedure may be the following:

- Subjectivity in predicting the environmental impacts
- Insufficient monitoring
- Limited consideration of cumulative impacts
- Insufficient involvement of public
- Poor coordination with land — planning documentation.

Subjectivity and poor coordination can be avoided with systemic planning and execution of the EIA and utilising objective tools for assessing impacts, such as in the work of Sebestyén (2021). However, involvement of public requires joint effort from the authorities, the developers, local municipalities and NGOs. Insufficient involvement might result in failed projects or dissatisfied locals causing friction between the owners and the citizens. The partners of DaWetRest have

[37] https://www.moew.government.bg

realised the risks and are dedicated in engaging the interested public beyond the requirements of Horizon program. They spend substantial energy in reaching out and asking for feedback from the local communities.

The deliverable identifies **twenty-eight** highly relevant EU legislation and several other strategic documents, including the Water Framework Directive, EU Zero Pollution Plan, EU Biodiversity Strategy, European Climate Law, and EU Communication for a Sustainable Blue Economy. Additionally, **nine (9)** Croatian, **eleven (11)** Bulgarian and **thirteen (13)** Romanian national and regional strategic documents were discussed. Altogether more than thirty documents were processed. ensuring that that every technical intervention the DaWetRest project undertakes in the Danube River Basin is mandated, **compliant, scalable and positioned to maximize its strategic contribution** to the high-level EU objectives for the Danube River Basin**.** It **directly contributes** to major targets, including achieving the **Water Framework Directive's** good ecological status and the Mission's goal to restore **25,000 km of free-flowing rivers**.

5. Constraints and limitations

This study focused on the EU legislation and three of the Member States' national regulations on topics relevant to the activities of DaWetRest. A limitation of the deliverable is that lawyers did not take part in the interpretation of the laws therefore the Reader should seek legal guidance instead of relying on this document. Nevertheless, the study highlights the complex matter of wetland restoration which becomes more challenging should the specific procedure be transferred or reapplied in another country or region where legislation may differ.

Another constraint is the number of countries involved in the examination. While the three countries cover the demo areas others could have been involved in the comparison. For instance, Hungary and Serbia are neighbouring countries, there are partners or associated partners are from these countries and the upscaling of the activities in the MD Danube could result in cross-boundary works and therefore EIA. The special rules of cross-boundary EIA procedure were also omitted in the analysis because that would require more detailed knowledge of the regulations of the respective countries.

Additionally, not all of the strategic and legislative documents were covered even though they might hold some level of relevance to DaWetRest. However, the lists are attached in annexes to this document in a simplified version for readability purposes and will be available upon request before the launch of the digital portal and in a readily available database on the portal later. The lists and the deliverable in their current form are suitable for guiding the interested parties towards relevant information, sparing the amount of time to compile the information themselves. The author advise the reader to pay attention the validity of the documents, some might be repealed by the time they come across this document.

Some of the known local issues such as the conflict of urban life and the inherent effects of its activities (e.g. local business or leisure) and the nature protection efforts are not discussed. The main reason is that the cases that came to the attention of the partners are locally relevant and very complex in nature. Some of them are illegal but stem from the need to survive and protect the local farms. However, the issues will be revisited in other tasks linked to LED and local communities to find a sustainable solution for everyone.

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Annex 1. List of documents collected in preliminary research

The full list with links and comments will be available per request, and in a later stage, on the project portal

Name of document	Type
A Europe Fit for the digital age	communication
Amendment of the MRV shipping Regulation	preparatory doc
Barcelona Convention: Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean	treaty
Circular Economy Action Plan	action plan
Common agricultural policy Strategic Plans	strategy
Danube River Basin Management Plan (DRBMP) Update 2021	action plan
EU Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries is relevant to biodiversity protection	action plan
EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil'	action plan
EU Arctic Policy	communication
EU Biodiversity Strategy 2030	strategy
EU Chemicals Strategy for Sustainability	strategy
EU Communication for a Sustainable Blue Economy	communication
EU Hydrogen Strategy	strategy
EU Mission Adaptation to Climate Change Implementation Plan	action plan
EU Mission Climate-Neutral and Smart Cities Implementation Plan	action plan
EU Mission: A Soil Deal for Europe	action plan
EU Offshore Renewables Energy Strategy	strategy
EU Smart and Sustainable Mobility Strategy	strategy
EU Soil Strategy for 2030	strategy
EU Strategy for Plastics in the Circular Economy	strategy
EU Strategy on Adaptation to Climate Change	strategy
EU Strategy on Energy System Integration	strategy
European Bioeconomy Strategy	strategy
European Climate Pact	communication
European Green Deal	strategy
European Neighbourhood Policy	strategy
EU-US agenda for global change	communication
Farm2fork Strategy	strategy
Fit for 55	action plan
Global Approach to Research and Innovation	communication
International Ocean Governance	communication
New EU forest strategy for 2030	strategy
Proposal for a Directive on Soil Monitoring and Resilience	preparatory doc

Name of document	Type
Proposal for a Nature Restoration Law	preparatory doc
Proposal for a revision of the Ambient Air Quality Directives	preparatory doc
Proposal for revising the "breakfast directives"	preparatory doc
Ramsaar treaty 4th strategic plan	strategy
Restore our Ocean and Waters by 2030	action plan
Revision of ETS directive	preparatory doc
Sustainable and optimal use of biomass for energy in the EU beyond 2020	communication
Sustainable Blue Economy Strategy	strategy
Sustainable Carbon Cycles	communication
The EU blue economy report 2024	report
The use of woody biomass for energy production in the EU	report
Towards a strong and sustainable EU algae sector	communication

Annex 2. Simplified list of EU legislation used in the study

Regulations and directives collected from the EUR-Lex page using the keywords listed in Chapter2.2.

The list only contains that were considered after the pre-screening, consisting of 147 records. The total number of legislation was 641 after removing duplication.

Title	Keywords
Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013	biomass, soil, biodiversity, climate, water, habitat
Regulation (EU) 2019/1009 of the European Parliament and of the Council of 5 June 2019 laying down rules on the making available on the market of EU fertilising products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/2003 (Text with EEA relevance)	biomass, soil, water
Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC	biomass, biodiversity, water, habitat
Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council (Text with EEA relevance.)	biomass, soil, biodiversity, climate
Regulation (EC) No 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents (Text with EEA relevance)	biomass, soil, water
Council Regulation (EU) 2022/1854 of 6 October 2022 on an emergency intervention to address high energy prices	biomass
Regulation (EU) 2023/857 of the European Parliament and of the Council of 19 April 2023 amending Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement, and Regulation (EU) 2018/1999 (Text with EEA relevance)	biomass
Regulation (EU) 2023/839 of the European Parliament and of the Council of 19 April 2023 amending Regulation (EU) 2018/841 as regards the scope, simplifying the reporting and compliance rules, and setting out the targets of the Member States for 2030, and Regulation (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review (Text with EEA relevance)	biomass, soil, habitat
Regulation (EU) 2022/2400 of the European Parliament and of the Council of 23 November 2022 amending Annexes IV and V to Regulation (EU) 2019/1021 on persistent organic pollutants (Text with EEA relevance)	biomass, soil
Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU (Text with EEA relevance)	biomass, climate

Title	Keywords
Regulation (EU) 2023/1805 of the European Parliament and of the Council of 13 September 2023 on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC (Text with EEA relevance)	biomass, biodiversity, climate
Regulation (EU) 2019/1010 of the European Parliament and of the Council of 5 June 2019 on the alignment of reporting obligations in the field of legislation related to the environment, and amending Regulations (EC) No 166/2006 and (EU) No 995/2010 of the European Parliament and of the Council, Directives 2002/49/EC, 2004/35/EC, 2007/2/EC, 2009/147/EC and 2010/63/EU of the European Parliament and of the Council, Council Regulations (EC) No 338/97 and (EC) No 2173/2005, and Council Directive 86/278/EEC (Text with EEA relevance)	soil, habitat
Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants (recast) (Text with EEA relevance.)	soil
Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products and repealing Council Regulation (EC) No 834/2007	biomass, soil, biodiversity, climate, GHG, water, habitat
Regulation (EC) No 401/2009 of the European Parliament and of the Council of 23 April 2009 on the European Environment Agency and the European Environment Information and Observation Network (Codified version)	soil
Commission Regulation (EC) No 1737/2006 of 7 November 2006 laying down detailed rules for the implementation of Regulation (EC) No 2152/2003 of the European Parliament and of the Council concerning monitoring of forests and environmental interactions in the Community	soil
Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91	soil, habitat
Commission Regulation (EU) 2023/2431 of 24 October 2023 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services	soil, habitat
Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005	biomass, soil, biodiversity, climate, GHG, water, habitat
Commission Regulation (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services	soil, habitat
Commission Regulation (EC) No 555/2008 of 27 June 2008 laying down detailed rules for implementing Council Regulation (EC) No 479/2008 on the common organisation of the market in wine as regards support programmes, trade with third countries, production potential and on controls in the wine sector	soil
Commission Regulation (EC) No 1882/2006 of 19 December 2006 laying down methods of sampling and analysis for the official control of the levels of nitrates in certain foodstuffs (Text with EEA relevance)	soil
Regulation (EU) 2023/2674 of the European Parliament and of the Council of 22 November 2023 amending Council Regulation (EC) No 1217/2009 as regards conversion of the Farm Accountancy Data Network into a Farm Sustainability Data Network	soil
Regulation (EU) 2021/2117 of the European Parliament and of the Council of 2 December 2021 amending Regulations (EU) No 1308/2013 establishing a common organisation of the markets in agricultural products, (EU) No 1151/2012 on quality schemes for agricultural products and foodstuffs, (EU) No 251/2014 on the definition, description, presentation,	soil

Title	Keywords
labelling and the protection of geographical indications of aromatised wine products and (EU) No 228/2013 laying down specific measures for agriculture in the outermost regions of the Union	
Commission Regulation (EU) No 102/2011 of 4 February 2011 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services	soil, habitat
Regulation (EU) No 259/2012 of the European Parliament and of the Council of 14 March 2012 amending Regulation (EC) No 648/2004 as regards the use of phosphates and other phosphorus compounds in consumer laundry detergents and consumer automatic dishwasher detergents Text with EEA relevance	soil
Commission Regulation (EC) No 907/2006 of 20 June 2006 amending Regulation (EC) No 648/2004 of the European Parliament and of the Council on detergents, in order to adapt Annexes III and VII thereto (Text with EEA relevance)	soil
Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species	biodiversity, water, habitat
Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023 establishing a carbon border adjustment mechanism (Text with EEA relevance)	soil, climate
Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse (Text with EEA relevance)	soil, climate, water
Regulation (EC) No 66/2010 of the European Parliament and of the Council of 25 November 2009 on the EU Ecolabel (Text with EEA relevance)	biodiversity
Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU Text with EEA relevance	soil, biodiversity, climate, habitat
Regulation (EU) 2022/869 of the European Parliament and of the Council of 30 May 2022 on guidelines for trans-European energy infrastructure, amending Regulations (EC) No 715/2009, (EU) 2019/942 and (EU) 2019/943 and Directives 2009/73/EC and (EU) 2019/944, and repealing Regulation (EU) No 347/2013	climate, habitat
Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport, and amending Directive 2009/16/EC (Text with EEA relevance)	climate
Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act)	climate
Regulation (EU) 2023/1781 of the European Parliament and of the Council of 13 September 2023 establishing a framework of measures for strengthening Europe's semiconductor ecosystem and amending Regulation (EU) 2021/694 (Chips Act) (Text with EEA relevance)	climate, habitat
Council Regulation (EU) 2022/2577 of 22 December 2022 laying down a framework to accelerate the deployment of renewable energy	habitat
Commission Regulation (EU) 2022/2473 of 14 December 2022 declaring certain categories of aid to undertakings active in the production, processing and marketing of fishery and aquaculture products compatible with the internal market in application of Articles 107 and 108 of the Treaty on the Functioning of the European Union	habitat
Council Regulation (EU) 2024/223 of 22 December 2023 amending Regulation (EU) 2022/2577 laying down a framework to accelerate the deployment of renewable energy	habitat
Commission Regulation (EU) 2023/966 of 15 May 2023 amending Council Regulation (EC) No 338/97 to reflect the amendments adopted at the 19th meeting of the Conference of	habitat

Title	Keywords
the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora	
Regulation (EU) 2021/818 of the European Parliament and of the Council of 20 May 2021 establishing the Creative Europe Programme (2021 to 2027) and repealing Regulation (EU) No 1295/2013 (Text with EEA relevance)	climate
Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU (Text with EEA relevance)	biomass, soil, biodiversity, climate
Regulation (EU) 2024/1468 of the European Parliament and of the Council of 14 May 2024 amending Regulations (EU) 2021/2115 and (EU) 2021/2116 as regards good agricultural and environmental condition standards, schemes for climate, environment and animal welfare, amendment of the CAP Strategic Plans, review of the CAP Strategic Plans and exemptions from controls and penalties	soil, biodiversity, climate, water, habitat
Regulation (EU) 2024/1143 of the European Parliament and of the Council of 11 April 2024 on geographical indications for wine, spirit drinks and agricultural products, as well as traditional specialities guaranteed and optional quality terms for agricultural products, amending Regulations (EU) No 1308/2013, (EU) 2019/787 and (EU) 2019/1753 and repealing Regulation (EU) No 1151/2012	soil, biodiversity, climate, water
Regulation (EU) 2024/573 of the European Parliament and of the Council of 7 February 2024 on fluorinated greenhouse gases, amending Directive (EU) 2019/1937 and repealing Regulation (EU) No 517/2014	soil, climate, GHG, water
Regulation (EU) 2024/590 of the European Parliament and of the Council of 7 February 2024 on substances that deplete the ozone layer, and repealing Regulation (EC) No 1005/2009	soil, climate, GHG
Regulation (EU) 2024/1449 of the European Parliament and of the Council of 14 May 2024 on establishing the Reform and Growth Facility for the Western Balkans	biodiversity, climate
Regulation (EU) 2024/795 of the European Parliament and of the Council of 29 February 2024 establishing the Strategic Technologies for Europe Platform (STEP), and amending Directive 2003/87/EC and Regulations (EU) 2021/1058, (EU) 2021/1056, (EU) 2021/1057, (EU) No 1303/2013, (EU) No 223/2014, (EU) 2021/1060, (EU) 2021/523, (EU) 2021/695, (EU) 2021/697 and (EU) 2021/241	climate, GHG, water
Commission Regulation (EU) 2021/2280 of 16 December 2021 amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein and Commission Regulation (EC) No 865/2006 laying down detailed rules concerning the implementation of Council Regulation (EC) No 338/97	habitat
Commission Regulation (EU) 2021/57 of 25 January 2021 amending Annex XVII to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards lead in gunshot in or around wetlands (Text with EEA relevance)	habitat
Commission Regulation (EU) 2019/2117 of 29 November 2019 amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein	habitat
Regulation (EU) 2017/2393 of the European Parliament and of the Council of 13 December 2017 amending Regulations (EU) No 1305/2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD), (EU) No 1306/2013 on the financing, management and monitoring of the common agricultural policy, (EU) No 1307/2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy, (EU) No 1308/2013 establishing a common organisation of the markets in agricultural products and (EU) No 652/2014 laying	habitat

Title	Keywords
down provisions for the management of expenditure relating to the food chain, animal health and animal welfare, and relating to plant health and plant reproductive material	
Commission Regulation (EU) 2017/160 of 20 January 2017 amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein	habitat
Commission Regulation (EU) 2016/2029 of 10 November 2016 amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein	habitat
Commission Regulation (EU) No 1320/2014 of 1 December 2014 amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein	habitat
Commission Regulation (EU) No 750/2013 of 29 July 2013 amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein	habitat
Regulation (EC) No 1946/2003 of the European Parliament and of the Council of 15 July 2003 on transboundary movements of genetically modified organisms (Text with EEA relevance)	habitat
Council Regulation (EC) No 708/2007 of 11 June 2007 concerning use of alien and locally absent species in aquaculture	habitat
Commission Regulation (EC) No 535/2008 of 13 June 2008 laying down detailed rules for the implementation of Council Regulation (EC) No 708/2007 concerning use of alien and locally absent species in aquaculture	habitat
Council Regulation (EC) No 338/97 of 9 December 1996 on the protection of species of wild fauna and flora by regulating trade therein	habitat
Commission Regulation (EU) No 101/2012 of 6 February 2012 amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein	habitat
Regulation (EU) No 304/2011 of the European Parliament and of the Council of 9 March 2011 amending Council Regulation (EC) No 708/2007 concerning use of alien and locally absent species in aquaculture	habitat
Commission Regulation (EU) No 709/2010 of 22 July 2010 amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein	habitat
Commission Regulation (EC) No 407/2009 of 14 May 2009 amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein	habitat
Commission Regulation (EC) No 506/2008 of 6 June 2008 amending Annex IV to Council Regulation (EC) No 708/2007 concerning use of alien and locally absent species in aquaculture	habitat
Commission Regulation (EC) No 1497/2003 of 18 August 2003 amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein	habitat
Commission Directive 2014/101/EU of 30 October 2014 amending Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy Text with EEA relevance	habitat
Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora	habitat
Council Directive 97/62/EC of 27 October 1997 adapting to technical and scientific progress Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora	habitat

Title	Keywords
Commission Directive 2010/60/EU of 30 August 2010 providing for certain derogations for marketing of fodder plant seed mixtures intended for use in the preservation of the natural environment Text with EEA relevance	habitat
Council Directive 2002/54/EC of 13 June 2002 on the marketing of beet seed	habitat
Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast) (Text with EEA relevance.)	biomass, soil, biodiversity, climate, GHG, water
Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants (Text with EEA relevance)	biomass
Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (recast) (Text with EEA relevance)	biomass, soil, water
Directive (EU) 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency and amending Regulation (EU) 2023/955 (recast) (Text with EEA relevance)	biomass, climate, GHG, water
Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment (Text with EEA relevance)	biomass, soil, biodiversity, water
Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure Text with EEA relevance	biomass
Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive) (Text with EEA relevance)	biomass, biodiversity, water, habitat
Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (Text with EEA relevance)	biomass, climate
Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy	biomass, soil, water, habitat
Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652	biomass, soil, habitat
Directive (EU) 2023/959 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading system (Text with EEA relevance)	biomass, soil
Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community (Text with EEA relevance)	biomass
Directive (EU) 2018/2002 of the European Parliament and of the Council of 11 December 2018 amending Directive 2012/27/EU on energy efficiency (Text with EEA relevance.)	biomass
Commission Directive (EU) 2017/845 of 17 May 2017 amending Directive 2008/56/EC of the European Parliament and of the Council as regards the indicative lists of elements to be taken into account for the preparation of marine strategies (Text with EEA relevance.)	biomass, habitat

Title	Keywords
Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC (Text with EEA relevance)	biomass, soil, habitat
Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community (Text with EEA relevance)	biomass
Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast) (Text with EEA relevance)	biomass, biodiversity, climate, GHG, water
Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC (Text with EEA relevance)	soil, biodiversity, climate, GHG, habitat
Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC Text with EEA relevance	climate, water
Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption (recast) (Text with EEA relevance)	climate, GHG, water
Directive (EU) 2024/869 of the European Parliament and of the Council of 13 March 2024 amending Directive 2004/37/EC of the European Parliament and of the Council and Council Directive 98/24/EC as regards the limit values for lead and its inorganic compounds and for diisocyanates	climate
Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) Text with EEA relevance	soil, water, habitat
Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides (Text with EEA relevance)	soil, biodiversity, habitat
Directive 2008/99/EC of the European Parliament and of the Council of 19 November 2008 on the protection of the environment through criminal law (Text with EEA relevance)	soil, habitat
Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks (Text with EEA relevance)	soil, water
Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)	soil, biodiversity, habitat
Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration	soil, water
Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air	soil
Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage	soil, biodiversity, water, habitat

Title	Keywords
Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC	soil
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	soil, biodiversity, habitat
Directive 2001/18/EC of the European Parliament and of the Council of 12 March 2001 on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC - Commission Declaration	soil, habitat
Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors	soil, GHG, water
Council Directive 2002/57/EC of 13 June 2002 on the marketing of seed of oil and fibre plants	habitat
Council Directive 2002/55/EC of 13 June 2002 on the marketing of vegetable seed	habitat
Council Directive 2002/56/EC of 13 June 2002 on the marketing of seed potatoes	habitat
Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture	soil
Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources	soil
Commission Directive (EU) 2015/996 of 19 May 2015 establishing common noise assessment methods according to Directive 2002/49/EC of the European Parliament and of the Council (Text with EEA relevance)	soil
Commission Directive 2004/29/EC of 4 March 2004 on determining the characteristics and minimum conditions for inspecting vine varieties	soil
Council Directive 68/193/EEC of 9 April 1968 on the marketing of material for the vegetative propagation of the vine	soil
Council Directive 1999/105/EC of 22 December 1999 on the marketing of forest reproductive material	soil
Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning	biodiversity, water, habitat
Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Codified version)	biodiversity, habitat
Commission Directive 2005/43/EC of 23 June 2005 amending the Annexes to Council Directive 68/193/EEC on the marketing of material for the vegetative propagation of the vine	soil
Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment Text with EEA relevance	soil, habitat
Commission Directive (EU) 2018/350 of 8 March 2018 amending Directive 2001/18/EC of the European Parliament and of the Council as regards the environmental risk assessment of genetically modified organisms	soil, habitat
Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy Text with EEA relevance	soil, habitat
Council Directive 2013/17/EU of 13 May 2013 adapting certain directives in the field of environment, by reason of the accession of the Republic of Croatia	soil, habitat
Council Directive 2006/105/EC of 20 November 2006 adapting Directives 73/239/EEC, 74/557/EEC and 2002/83/EC in the field of environment, by reason of the accession of Bulgaria and Romania	soil, habitat

Title	Keywords
Regulation (EU) 2024/1028 of the European Parliament and of the Council of 11 April 2024 on data collection and sharing relating to short-term accommodation rental services and amending Regulation (EU) 2018/1724Text with EEA relevance.	water
Commission Regulation (EU) 2024/238 of 15 January 2024 amending Annex I to Regulation (EC) No 1334/2008 of the European Parliament and of the Council as regards the introduction of restrictions on the use of certain flavouring substances	water
Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC	water
Directive 2009/54/EC of the European Parliament and of the Council of 18 June 2009 on the exploitation and marketing of natural mineral waters (Recast) (Text with EEA relevance)	water
Directive 2005/35/EC of the European Parliament and of the Council of 7 September 2005 on ship-source pollution and on the introduction of penalties for infringements	water
Directive 2013/53/EU of the European Parliament and of the Council of 20 November 2013 on recreational craft and personal watercraft and repealing Directive 94/25/EC Text with EEA relevance	water