INTERNATIONAL SAVA RIVER BASIN COMMISSION

INTERIM REPORT

on

2nd Sava River Basin Management Plan

Programme of Measures Implementation

2025

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Abbreviations

BA	Bosnia and Herzegovina
BA_Fed	Bosnia and Herzegovina Federation of Bosnia and Herzegovina
BA_RS	Bosnia and Herzegovina Republika Srpska
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
EEC	European Economic Community
EIA	Environmental Impact Assessment
EU	European Union
EUR	euro
FASRB	Framework Agreement on the Sava River Basin
HR	Republic of Croatia
HYMO	hydomorphology
ICPDR	International Commission for the Protection of the Danube River
IED	Industrial Emission Directive
ISRBC	International Sava River Basin Commission
ME	Montenegro
MoP	Meeting of the Parties
MS	Member States
NbS	Nature based Solution
NVZ	Nitrate Vulnerable Zone
PE	Population Equivalent
PEG	Permanent Expert Group
RBMP	River Basin Management Plan
RS	Republic of Serbia
SEA	Strategic Environment Assessment
SI	Republic of Slovenia
SRBA	Sava River Basin Analysis
SWMI	Significant Water management Issue
UNECE	United Nations Economic Commission for Europe
UWWTD	Urban Wastewater Treatment Directive
WFD	Water Framework Directive
WWTP	Waste Water Treatment Plant

1 Introduction

The Interim Report has been prepared with the aim of providing information on advancement in the 2nd Sava RBMP Programme of Measures Implementation in all Sava basin countries. For the purpose of the Interim report preparation all measures from the 2nd Sava RBMP Programme of Measures are assessed in accordance with the two criteria: (i) implementation progress and (ii) types of measures implemented.

For tracking the implementation progress, data are collected on implementation status for each of the measures indicating if:

- Implementation finalized-measure not active,
- Implemented, target reached-maintenance of the results will continue, measure still active,
- Implementation on-going, or
- Not started.

Additionally, data are collected in the following categories to describe types of actions used for measures implementation:

- Legal acts,
- Programmes/Projects,
- Investments-Construction,
- Investments-Documentation,
- Research/Monitoring,
- Registers development and
- Economic instruments.

The Sava countries' best practices or lighthouse projects in measures implementation are indicated where available. In Annexes detailed information are presented about 2nd Sava RBMP Programme of Measures (Annex I), Implementation progress (Annex II), Types of measures implemented (Annex III), and data on financial resources allocated on the Sava countries' level for measure implementation related to the UWWT Directive (Annex IV).

Outcomes from the Interim report will facilitate identification of common challenges and gaps in the Programme of Measures implementation and provide guidelines for future "Sava" planning cycles.

The Interim Report represents the result of joint and dedicated work of the Permanent Expert Group for River Basin Management (PEG RBM) of the International Sava River Basin Commission (ISRBC) in the period September 2023-February 2025.

2 Background

The foundation for transboundary cooperation towards sustainable development in the Sava River Basin, Framework Agreement on the Sava River Basin (FASRB), unique international agreement which integrates many aspects of water resources management, was signed by its Parties (Bosna and Herzegovina (BA), Republic of Croatia (HR), Republic of Slovenia (SI), and Republic of Serbia (RS)) on the 3 December 2002 in Kranjska Gora, Slovenia and ratified in 2004. The cooperation with Montenegro on a technical level was established based on the Memorandum of Understanding signed in 2013. One of the main goals of the FASRB is *Establishment of the sustainable water management*.

Towards the achievement of the established goal, through the FASRB, the signatory Parties expressed their determination to cooperate in line with the Water Framework Directive[1] (WFD), to make all efforts towards implementation of the WFD on the national level and shared international river basins and to develop and cooperate in preparatory activities related to the development of the joint Sava River Basin Management Plan.

So far, two "Sava" river basin management planning cycles were finalized. Sava River Basin Management Plans (Sava RBM Plan), as one of the major achievements in regional cooperation in the water sector, were approved by the Meeting of the Parties (MoP) to the FASRB (Sava RBM Plan on the 5th MoP December 2, 2014, Zagreb, Republic of Croatia, and the 2nd Sava RBM Plan on the 9th MoP on December 9, 2022, Zagreb, Republic of Croatia).

The 2nd Sava RBM Plan, with aim to enhance basin wide policy framework for prevention of further deterioration or/and improvement of the status of all waters and to strengthen collaboration towards long-term and sustainable use of the water resources within the Sava River Basin, is developed, to a possible extent in accordance with the WFD requirements, for the six years period 2022-2027. The 2nd Sava RBMP Programme of Measures responds to all the significant pressures towards the achievement of the agreed visions and objectives defined for the Sava River Basin and represents the basis of further international coordination.

As stipulated by Article 15.3 WFD, Interim Report describing progress in implementation of the planned Programme of Measures, should be developed within three years of the publication of each river basin management plan or update under Article 13. This report aims to make a joint assessment of the 2nd Sava RBMP Programme of Measures implementation.

[1] 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

3 Sava River Basin Management Planning

The implementation of the WFD in the Sava River Basin, in line with its requirements from Article 5 and Article 6, began with the development of the 1st Sava River Basin Analysis (SRBA) where quantitative and qualitative characteristics of the Sava River and its main tributaries were assessed. Additionally, hydrology and hydromorphology reports were prepared, and key integration issues between water management and flood risk management, and water management and navigation development were addressed.

In the SRBA Report. the criteria for surface and groundwater bodies to be taken into consideration for conducting the analysis in the "Sava" planning cycles were agreed upon and established, as follows:

- Surface Water Bodies on the Sava River and its tributaries with a catchment size >1,000 km^2 and on the rivers with catchment area <1,000 km^{2}defined as of a basin-wide importance (Sotla/Sutla, Lašva and Tinja)
- Trans-boundary and national groundwater bodies which are important due to their size (area >1,000 km^2), and trans-boundary ground water bodies (area <1,000 km^2) which are important due to various other criteria, e.g. socioeconomic importance, significant uses, impacts, pressures, and/or interaction with aquatic eco-system.

The ISRBC accepted the SRBA Report in September 2009 as a sound foundation for the next steps in developing the Sava RBM Plan.

The activities on developing the 1st Sava RBM Plan started in 2009, following to the possible extent requirements of the WFD, the methodology, processes and practice applied at the Danube River Basin level, with above-explained level of details. **Significant water management issues** (SWMI) in the Sava River Basin were defined as organic pollution, nutrient pollution, hazardous substances pollution, hydromorphological alterations, and pressures on groundwater quality and quantity. Furthermore, basin wide important additional issues, that due to lack of available data for their assessment are defined as SWMI "candidate", were sediment issues (pressures and impacts on sediments quantity and quality), and invasive alien species. To facilitate preparation of the Programme of Measures in the 1st Sava RBM Plan, for each of the SWMIs, **visions for the Sava River Basin** were developed, as specific long term perspective goals and desired conditions which would result from effective river basin management practices implementation. The created visions capture the essence of the objective to achieve, and include key elements such as desired future state, core values and principles for the river basin management and planning in the Sava River Basin. To facilitate steps toward realization of the overall goals (visions), **management objectives** were created as a foundation for the development of the Programme of Measures and progress tracking indicators, towards effective measures' implementation.

The 2nd "Sava" planning cycle started with the preparation of the 2nd SRBA Report as an update of the first one from the 2009. It was finalized in 2016 and accepted by the ISRBC in June 2017. In parallel also the Report on SWMIs with the interim overview of

implementation of measures was prepared reconfirming key issues affecting the water environment in the Sava River Basin, approved by the ISRBC in December 2017.

Both documents represent important steps towards preparation of the 2nd Sava RBM Plan.

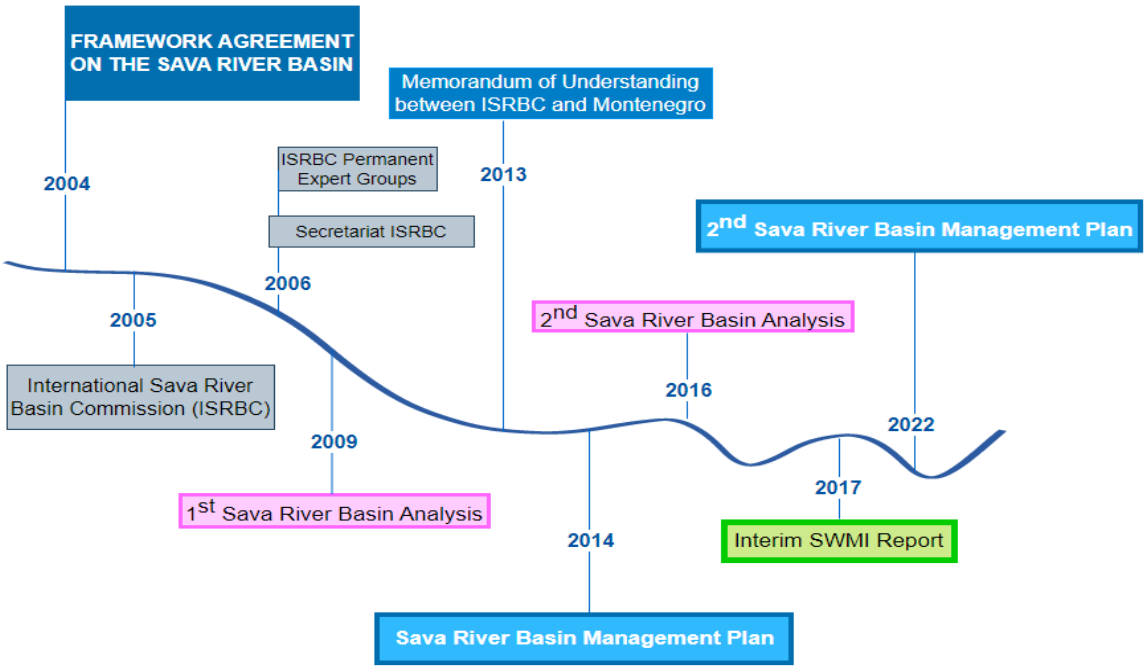


Figure 1: Milestones in transboundary cooperation towards sustainable river basin management in the Sava River Basin

As main advancement in the 2nd in comparison to the 1st river basin management and planning cycle in the Sava River Basin can be recognized:

- Numerous changes introduced through the new surface water bodies delineation, performed in all riparian countries, (except in Slovenia). The changes are based on the further and more comprehensive implementation of WFD requirements and a more accurate and detailed basis, data and information taken into consideration.
- The number of groundwater bodies important in the basin wide context increased from 48 in the 1st Sava RBM Plan to 60 in the 2nd Sava RBMP providing possibilities for the more detailed analysis.
- Significant improvement in Urban Wastewater Treatment Directive[2] (UWWTD) implementation related to agglomerations delineation in a majority of the basin countries.
- Increased number of population equivalent (PE) connected to the sewage networks, as well the decrease in PE load that is neither connected to sewage system nor treated on the wastewater treatment plants. Furthermore, decrease of the share (28%) of all agglomeration PE >2.000 PE are not connected to a sewerage collection system nor to a wastewater treatment plant (in comparison to 40% from the1st Sava RBMP). Significant decrease of estimated total emission load (by 53% of BOD5 and by 57% for COD) due to increased number of agglomerations with

[2] Council Directive of 21 May 1991 concerning urban waste water treatment (91/271/EEC)

wastewater treatment plants (WWTP) in the basin (14% of agglomeration with WWTP in the 1st Sava RBM Plan and 30% in the 2nd Sava RBM Plan, mainly due to newly constructed WWTPs in Slovenia and Croatia).

- Significant improvement in data exchange practices through the ISRBC's common platform Sava GIS, and notable increase of collected data related to hydromorphology, protected areas and data on surface and ground water monitoring.
- Water status assessment practices improved significantly in all countries in terms of methodological approach and as well in the achieved confidence level.
- Basin-wide economic analysis of water use and water services was updated, providing elaboration of potential sources as well for financing of the Programme of measures implementation.
- **The updated Programme of Measures for the Sava River Basin** was developed focused on implementation of the relevant EU water directives requirements and principles, while considering the status of the EU and non-EU countries, aiming towards achievement of the environmental objectives according to the WFD, visions and management objectives for the Sava River Basin.

As it is stated in the 9th MoP Declaration, Parties commit themselves, „ *to implement the Programme of Measures foreseen in the updated Sava RBM Plan, in order to contribute to meeting the common objectives*" and are decisive to "*ensure adequate resources for the continuation of the activities coordinated by the Sava Commission, calling for transboundary solutions that will integrate social, environmental and economic principles for sustainable and resilient development of the Sava River Basin*".

Brzaci Savica, Ivan Ranogajec (SavaPhotoContest2023)

3.1 The 2nd Sava RBMP Programme of measures

The WFD requires the preparation of Programmes of Measures as a key tool for achieving the environmental objectives outlined in Article 4. While environmental objectives as set in the WFD are not explicitly defined for the Sava River Basin, considering different EU membership status among Sava riparian countries which reflects their varying political, economic, and legislative alignments with EU requirements, these objectives are jointly translated into commonly agreed visions and management objectives. Visions and management objectives for the Sava River Basin are determined for all water management issues and serve to guide steps toward achievement of good status of all water bodies, aiming to ensure sustainable use and protection of all waters and related ecosystems.

The 2nd Sava RBMP Program of Measures builds upon existing national RBM measures and outlines the necessary actions to be implemented in the upcoming river basin management cycles towards achievement of the Sava River Basin visions and management objectives. It consists of 58 measures, 7 to be implemented in EU Member States, 10 to be implemented in non-EU Member States, and 41common measures as shown in Figure 2.

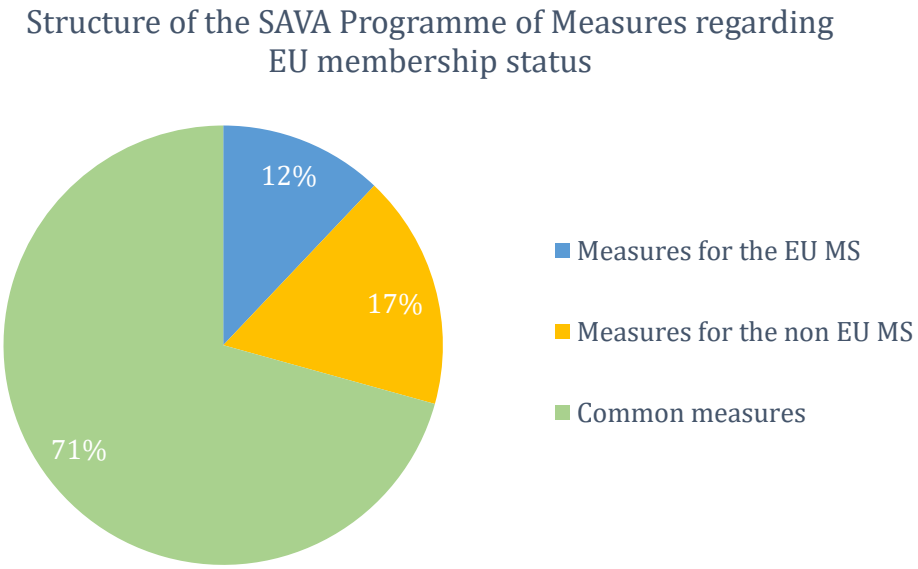


Figure 2: Structure of the Sava Programme of Measures in accordance with the countries' EU membership status

Besides that the "Sava" Programme of Measures is designed to address SWMIs defined for the Sava River Basin and as well as the SWMI "candidates", the set of measures is as well defined for protected areas (although as such are not defined as SWMI, thus no corresponding vision and management objectives are established), due to the requirements of WFD Article 7 and their basin wide importance. Finally, defined as "other" measures are measures related to Unregulated solid and mining waste disposal.

Moreover, in addition to the basic set of measures, SWMIs related to HYMO-morphological alterations and groundwater quality, have as well supplementary sets of measures with aim to more specifically define steps needed to be undertaken towards the achievement of the defined objectives.

Table 1: Structure of the Sava Programme of Measures in accordance with the water management issues

Water management issues covered by the 2nd Sava RBM Plan Programme of Measures	
Significant Water Management Issues	
Organic Pollution	
Nutrient Pollution	
Hazardous Substances Pollution	
Hydromorphological Alterations	
	Interruption of River and Habitat Continuity
	Water Abstraction
	Impoundment
	Hydropeaking
	Morphological Alterations
	Future Infrastructure Projects
Groundwater quality	
Groundwater quantity	
Significant Water Management Issues – "CANDIDATE"	
Sediment Issues	
Invasive Alien Species	
Additional Issue	
Protected Areas	
Other Issue	
Unregulated solid and mining waste disposal	

The main objective of the 2nd Sava RBM Plan Programme of measures is to set actions that will be in line with the WFD requirements, and enable the achievement of environmental/management objectives related to water status, ecosystem health and biodiversity preservation. Furthermore, it aims as well to:

- Enhance transboundary cooperation and collaborative approach.
- Support exchange of information in the basin ensuring consistency and coherency of the national/international planning.
- Facilitate stakeholder engagement and consultation process on actions planned to be undertaken.
- Promote basin-wide decision-making processes towards transboundary solutions for sustainable water management.
- Contribute to sustainable water use, enhance climate resilience of the basin and ensure long term sustainability of water resources.

In Annex I can be found a comprehensive list of SWMIs, visions, management objectives, and the 2nd Sava RBM Plan Programme of Measures formulated for the Sava River Basin.

4 The 2nd Sava RBMP Programme of Measures Implementation

The analysis of the Sava Programme of Measures implementation was conducted based on the data delivered by members of the ISRBC PEG RBM, regarding implementation progress and types of measures implemented in each of the Sava countries.

For each of the SWMIs Implementation progress and Types of measures implemented are presented on a country level as well as on the Sava Basin level to ensure recognition of advancements at both the national and basin-wide scales.

4.1 Organic pollution

Measures in the 2nd Sava RBM Plan, as steps towards the achievement of the management objectives for organic pollution are defined as:

For EU MS (Slovenia and Croatia)

- Implementation of the UWWT Directive (91/271/EEC);
- Implementation of the Sewage Sludge Directive (86/278/EEC);
- Implementation of the Industrial Emission Directives-IED (2010/75/EU);
- Increase of the efficiency and level of treatment when necessary.

For non-EU countries (Bosnia and Herzegovina, Serbia, and Montenegro),

- Specification of the number of wastewaters collecting systems (connected to respective WWTPs);
- Specification of number of municipal and industrial wastewater treatment plants which are planned to be constructed by 2027 including:
    - Specification of treatment level (secondary or tertiary treatment);
    - Specification of emission reduction targets.

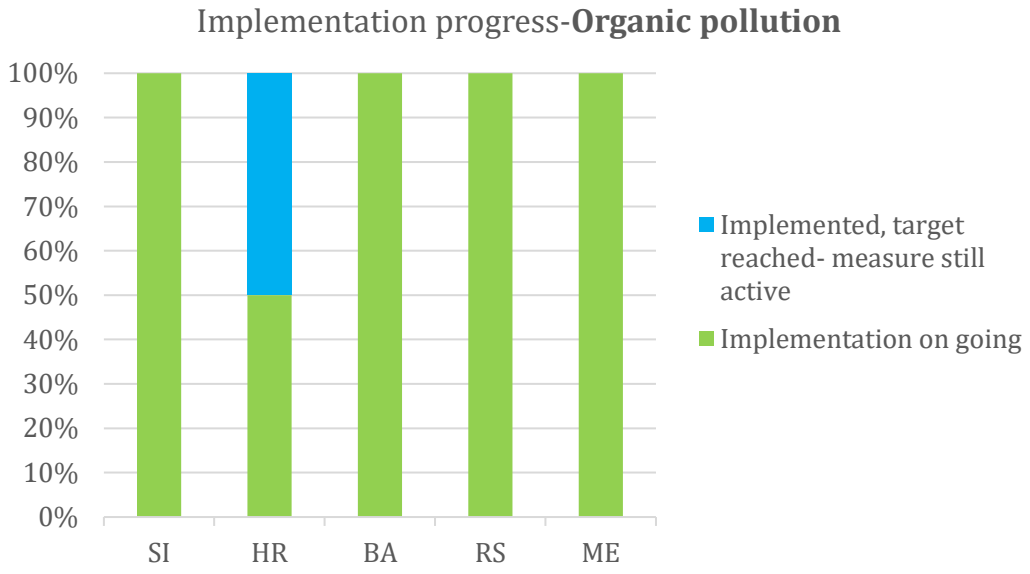


Figure 3: Implementation progress of measures for organic pollution (country level)

Considering measures for organic pollution (4 measures defined for EU MS, and two measures for non-EU MS) implementation progress as shown in Figure 3 is ongoing in all the Sava basin countries, while two measures in HR, have status indicated as *Implemented, target reached-maintenance of the results will continue, measure still active.* Detail information regarding measures implementation status on the Sava countries' level can be found in Annex II.

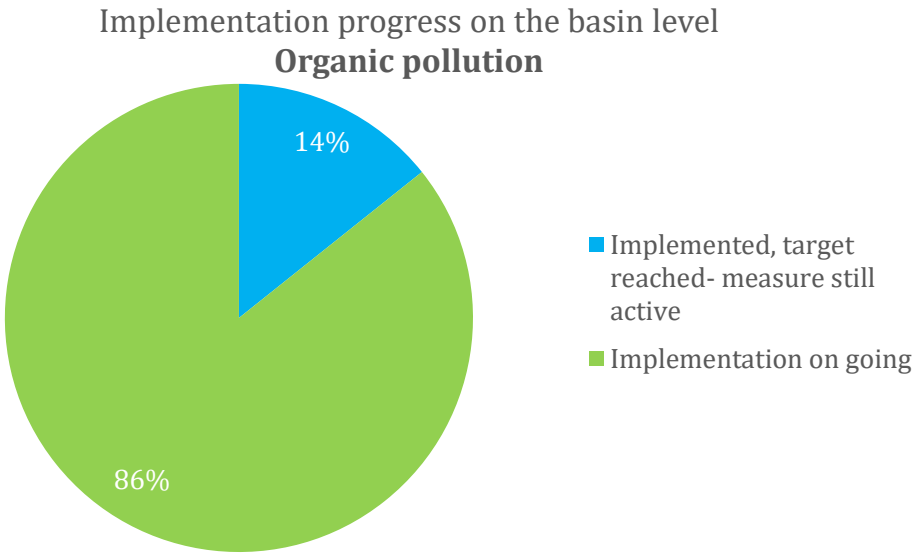


Figure 4: Level of measures implementation- Organic pollution, Sava River Basin level

Considering the basin wide aspect (all measures for all the Sava basin countries), 86% of the measures for organic pollution have status *Implementation ongoing*, while 14% have status *Implemented, target reached maintenance of the results will continue, measure still active*, as it is presented in Figure 4.

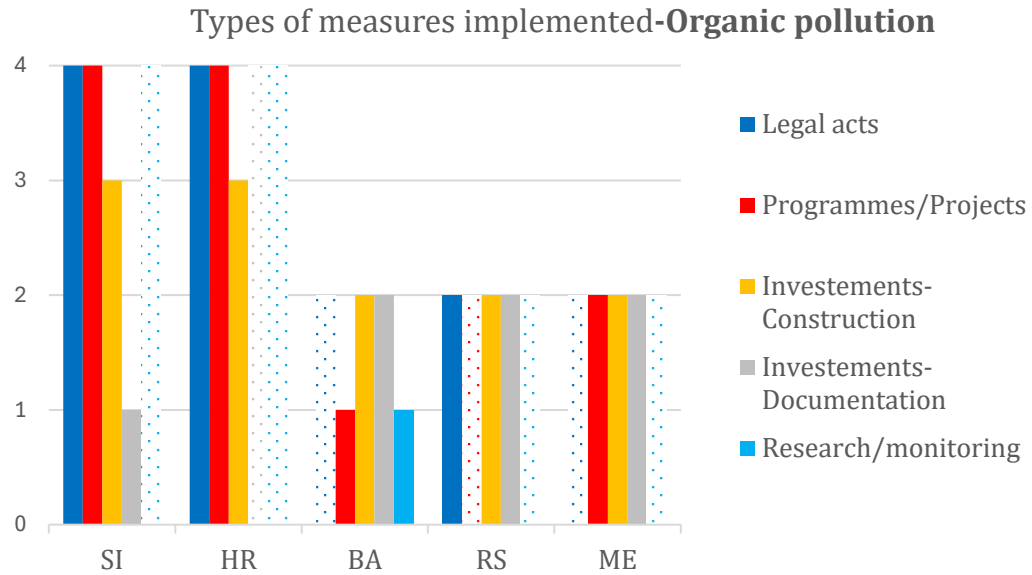


Figure 5: Types of measures implementation- Organic pollution (pattern filled columns indicate type of measures that are not in implementation in the basin country)

Types of measures implemented for organic pollution in the Sava countries are presented in Figure 5 indicating the number of measures implemented by the specific type. Measures for Organic pollution are implemented in all Sava countries by *Investments-Construction*, by *Programmes/Projects* in SI, HR, BA (in BA_RS) and ME, by *Legal Acts* in SI, HR and RS, by *Investments-Documentation* in all Sava countries except in HR, and by *Research/Monitoring* in BA (in BA_RS).

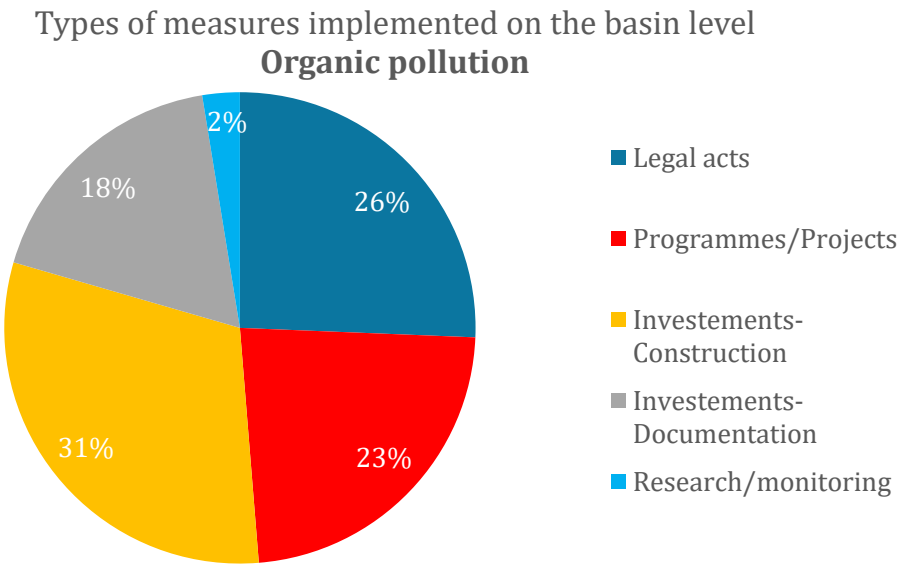


Figure 6: Types of measures implemented for organic pollution on the Sava River Basin level

In Figure 6, the share of types of measures implemented to address organic pollution is presented for the Sava River Basin level.

Detailed information regarding types of measures implemented on the Sava countries' level can be found in Annex III.

Light-house projects Republic of Croatia

Construction of WWTPs with tertiary treatment for agglomeration Bjelovar

In Bjelovar, ongoing is construction of a wastewater treatment plant WWTP for agglomerations of Bjelovar, Gudovac and Rovišće with the capacity of 47,000 PE. WWTP is planned to be equipped with tertiary treatment with conventional activated sludge technology and aerobic sludge stabilization and sludge drying beds. Besides tertiary more advanced treatment is planned for reduction of BOD_5, N and P effluent concentration, to satisfy the good status requirements of the recipient river Česma. Project also comprises reconstruction of 2,595 m existing drainage pipelines, construction of 15,326 m of new drainage pipelines with 10 associated pumping stations and monitoring and control systems. Besides, within the project, 6,204 m of existing water supply pipelines in the city of Bjelovar will be reconstructed, and the monitoring and control system will be upgraded

Improvement of municipal water infrastructure for agglomeration Kutina

In Kutina, the construction of the WWTP with the tertiary treatment and anaerobic sludge digestion, cogeneration plant and solar sludge drying with the capacity of 23,000 PE is ongoing. In addition to the basic water and excess sludge treatment processes, a unit for receiving septic tank contents, and a cogeneration unit for electricity and heat production from the generated biogas is planned, together with a retention basin and an outlet pumping station. A biofilter will be installed to treat polluted air from the mechanical pretreatment and the sludge treatment process. The project largely includes the reconstruction and expansion of the public drainage system, as well comprises reconstruction and expansion of the water supply system. A monitoring and control system is planned for both systems. The project is planned to be finalized in 2026.

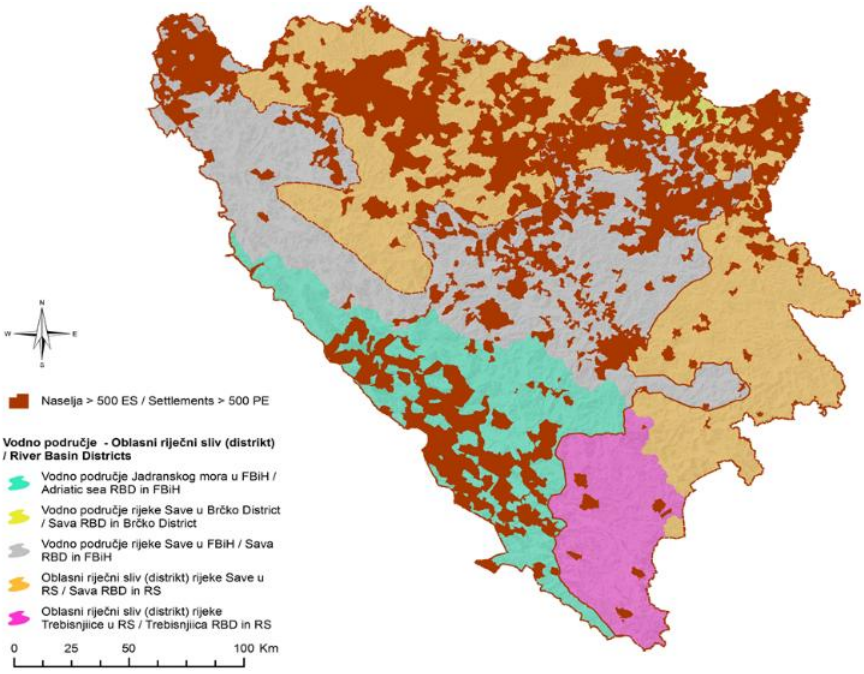
Light-house project Bosnia and Herzegovina

Development of a Master Plan for Agglomerations-

In recent years, Bosnia and Herzegovina has successfully identified administrative reform and comprehensive economic development as national priorities. In this context, water resources management has become a key issue in public administration. A number of important decisions have been adopted to rationalize the use and strengthen the protection of water resources.

To support environmental protection, ensure the sustainable water resources management, and accelerate the reform of the water sector, Bosnia and Herzegovina initiated a project aimed at preparing the technical grounds and documents necessary for efficient planning and implementation of two of the EU most demanding directives: the UWWTD and the WFD. The project "Development of a Master Plan for Agglomerations in Bosnia and Herzegovina for Efficient Planning and Implementation of the EU EUWTD" (2022-2024), was funded under the EU's Instrument for Pre-Accession Assistance (IPA 2018).

The project resulted in the following outcomes: (i) Analysis of the UWWTD requirements and best practices in EU countries regarding implementation planning. (ii) Assessment of municipal wastewater planning and treatment, including stakeholder analysis, evaluation of existing infrastructure, and forecasting future wastewater loads. (iii) Development of the Master Plan for Agglomerations, which will serve in the future as a primary planning framework. (iv) Identification of short-term, medium-term, and long-term investment projects, including cost assessments and prioritization. (v) Development of Directive Specific Implementation Plan and Action Plans for Implementation plans for the implementation of the UWWTD in Bosnia and Herzegovina. (vi) Evaluation of stakeholders' capacity and needs, followed by the creation of a Capacity Building Program to ensure the efficient implementation of the UWWTD.



Settlements with an organic load higher than 500 PE

4.2 Nutrient pollution

Measures in the 2nd Sava RBM Plan, as steps towards the achievement of the management objectives for nutrient pollution are defined as:
For EU MS (Slovenia and Croatia)

- Implementation of the UWWT Directive (91/271/EEC);
- Implementation of the Nitrates Directive (91/676/EEC);

For non-EU countries (Bosnia and Herzegovina, Serbia, and Montenegro),

- Introduction of a maximum limit of 0.2 to 0.5% P weight/weight for the content of total phosphorus in laundry detergents for consumer use;
- Working towards a market launch of polyphosphate-free dishwasher detergents for consumer use;
- Definition of the basin-wide and/or national quantitative reduction targets (for point and diffuse sources) taking the respective preconditions and requirements of the Sava countries into account;
- Specification of number of wastewater collecting systems (connected to respective WWTPs), which are planned to be constructed by 2027;
- Creation of baseline scenarios for nutrient input taking the respective preconditions and requirements of the Sava countries into account;
- Implementation of the Best Available Techniques and Best Environmental Practices regarding agricultural practices (for EU Member States linked to EU Common Agricultural Policy – CAP).

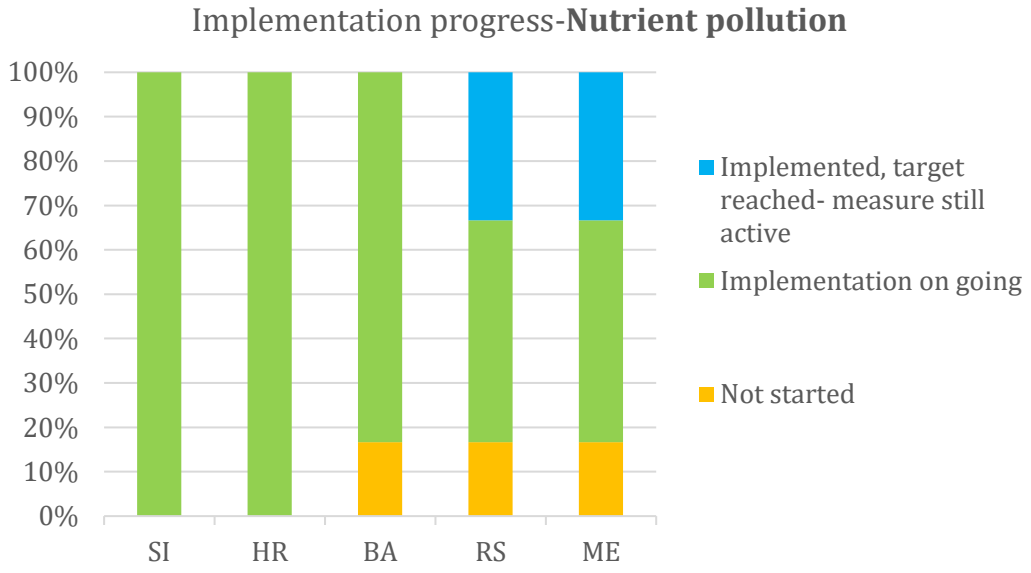


Figure 7: Implementation progress of measures for nutrient pollution (country level)

Considering measures for nutrient pollution (two (2) measures defined for EU MS, and six (6) measures for non-EU MS) implementation progress is as shown in Figure 7. In SI and HR all measures are in the status *Implementation ongoing*. *Implementation ongoing* is indicated as well for five (5) measures in BA (three (3) measures are ongoing in both entities, while two (2) measures have ongoing status only in BA_RS), as well as for three (3) measures in RS and ME. Two (2) measures in RS and ME have status *Implemented, target reached-maintenance of the results will continue, measure still active.*

Implementation status *Not started* have one measure in BA, RS and ME. Detail information regarding measures implementation status on the Sava countries' level can be found in Annex II.

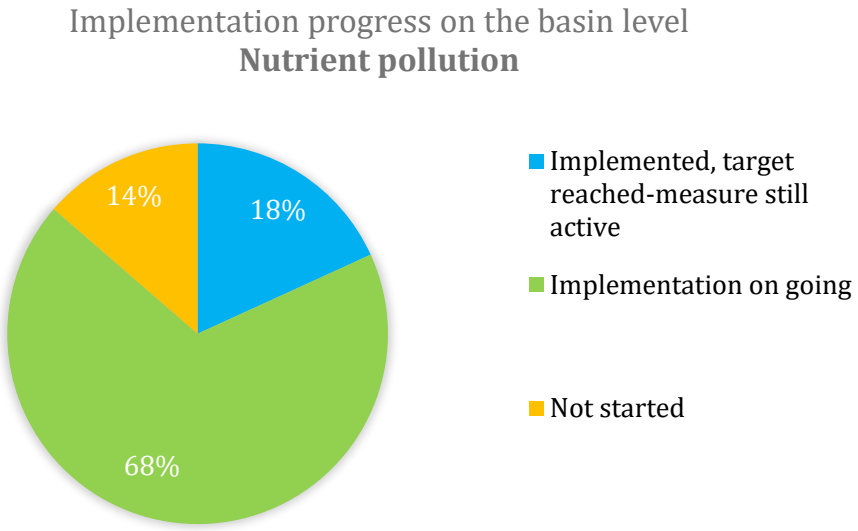


Figure 8: Implementation progress of measures for nutrient pollution Sava River Basin level

Considering the basin wide aspect, in total (all measures for all the Sava basin countries), 68% of the measures for nutrient pollution have status *Implementation ongoing*, while 18% of measures have status *Implemented, target reached maintenance of the results will continue, measure still active*, and 14% *Not started*, as it is presented in Figure 8.

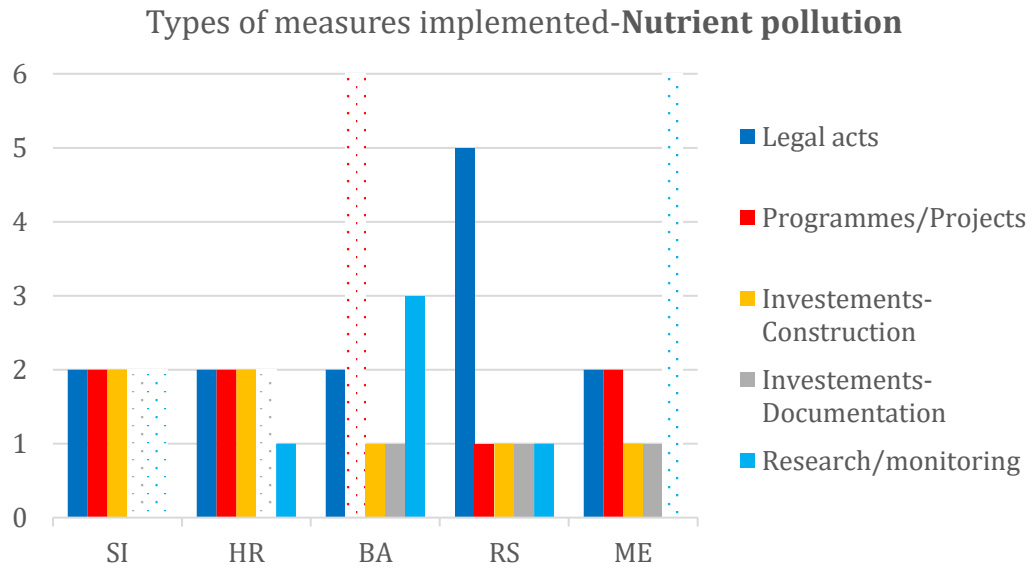


Figure 9: Types of measures implementation-Nutrient Pollution (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 9, the types of measures implemented addressing the nutrient pollution in the Sava countries are presented. *Legal acts* are used as type of measures for all measures in SI and HR, for two (2) measures in BA (in BA_RS), five (5) in RS, and two (2) in ME. Through

Programmes/Projects measures are carried out all measures in SI and HR, for one (1) measure in RS, and two (2) measures in ME. Type of measures *Investments-Construction* is used for all measures in SI and HR, for one (1) measure in BA, RS and ME. *Investments - Documentation* is applied for one (1) measure in BA, RS and ME. In HR one (1) and three (3) measures in BA are implemented by *Research/Monitoring*.

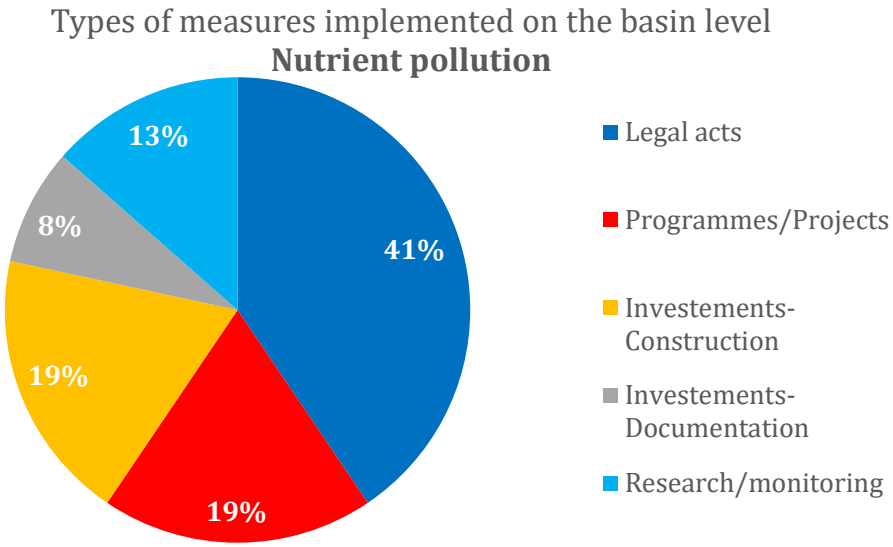


Figure 10: Types of measures implemented for nutrient pollution on the Sava River Basin level

In Figure 10, the share of types of measures implemented to address nutrient pollution is presented for the Sava River Basin level.

Detail information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

Light-house project Montenegro

Support for the Water Management Implementation and Monitoring in Montenegro (2019- 2024)

The funding for the project which covered four water related directives: the Nitrates Directive 91/676/EEC, the Floods Directive 2007/60/EC, the Bathing Water Directive 2006/7/EC, and the Marine Strategy Framework Directive 2008/56/EC, was ensured through EU funds (IPA2016). The project's implementation is closely linked to strengthening the capacities of relevant institutions.

Regarding the Nitrates Directive, the following activities have been carried out:

- *Identification of the nitrate vulnerable zones*
- *Development of the Action Plan with measures addressing water protection from pollution caused by agricultural sources by limiting the application of nitrogen fertilizers on land in vulnerable zones in Montenegro.*

Technical and scientific data were collected and primarily evaluated to identify all sources of pollution, including pollution from livestock effluents and fertilizers, as well as to identify waters that are or potentially may be polluted by nitrates.

The following criteria were considered when determining vulnerable zones for nitrates (NVZ):

- *Areas designated for water-related protected areas and those for water abstraction for human consumption;*
- *Highly permeable aquifer systems (karst aquifers, alluvial intergranular aquifers) located in actively used agricultural land;*
- *Areas and basins where water quality has deteriorated due to nitrogen compounds (both surface and groundwater);*
- *Livestock density per unit of used agricultural land at the municipality or cadastral municipality level;*
- *The amount of organic and mineral fertilizers used per hectare of arable land;*
- *"Hotspots" – direct discharge of untreated municipal or industrial wastewater into recipients (only regarding nutrient pollution).*

Based on all the data evaluated and according to the above-listed criteria, the proposal of the National Working Group was considered and accepted. Delineated were 14 NVZs, along with sanitary protection zones (I and II) around 92 water sources which are used for drinking water supply.

Out of the 14 NVZs (total area 859.23 km^2, or 6.22% of Montenegro's territory) 5 are located in the Danube River Basin. The largest is the Zeta Plain, covering around 334 km^2, of which about 7% belongs to the large agro-complex "Plantaže." The second largest area is the Nikšić Field, which includes the neighboring Šipačno Field, covering about 120 km^2. The smallest NVZs are the three fields in the Orjen Mountain area: Ubli, Dragalj, and Grahovo, each lower than 10 km^2. In central and northern Montenegro, some rivers are also classified as NVZs. These include: the Piva River from the Brezno plateau to the surface water reservoir "Mratinje" (Plužine area), the Lim River (from Gusinje to Lake Plav and a shorter section downstream from the lake), the Ibar River (downstream from Rožaje), the Ćehotina River (downstream from Pljevlja), and the Vezišnica River (near Pljevlja).

4.3 Hazardous substances pollution

Measures in the 2nd Sava RBM Plan, as steps towards the achievement of the management objectives for hazardous substances pollution are defined as:

For EU MS (Slovenia and Croatia)

- Implementation of the Industrial Emission Directive- IED (2010/75/EC) which also relates to the Directive 2008/105/EC and Directive 2013/39/EC

For non-EU countries (Bosnia and Herzegovina, Serbia, and Montenegro),

- Implementation of Best Available Techniques and Best Environmental Practices including further improvement of treatment efficiency, treatment level and/or substitution.
- Exploring the possibility to set down quantitative reduction objectives for pesticide emission in the Sava RB.

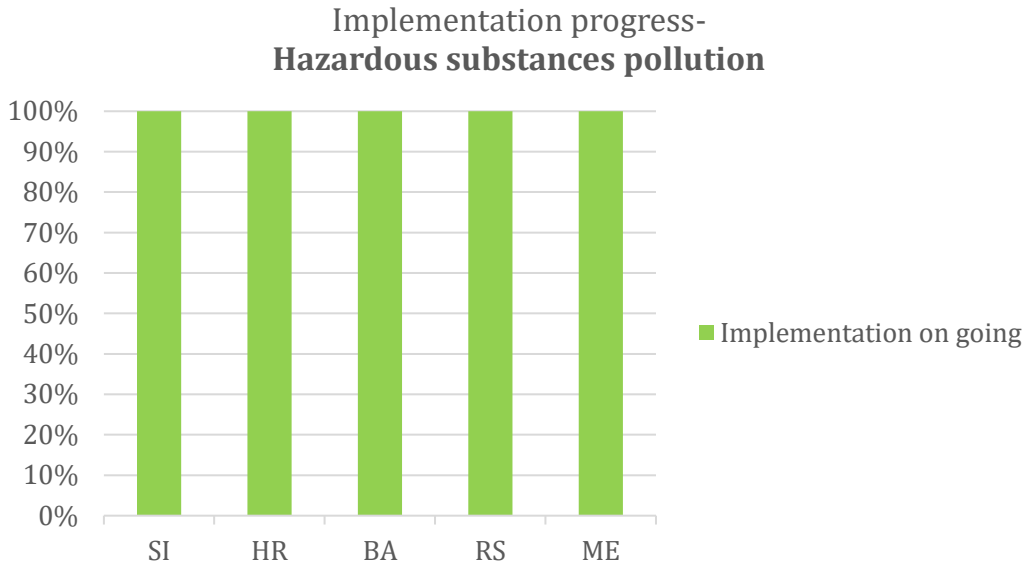


Figure 11: Implementation progress of measures for hazardous substances pollution (country level)

Considering measures for hazardous substances pollution (one measure defined for EU MS, and two measures for non-EU MS) implementation progress is as shown in Figure 11 All measures in all Sava countries have status *Implementation on going.* Detail information regarding measures implementation status on the Sava countries' level can be found in Annex II.

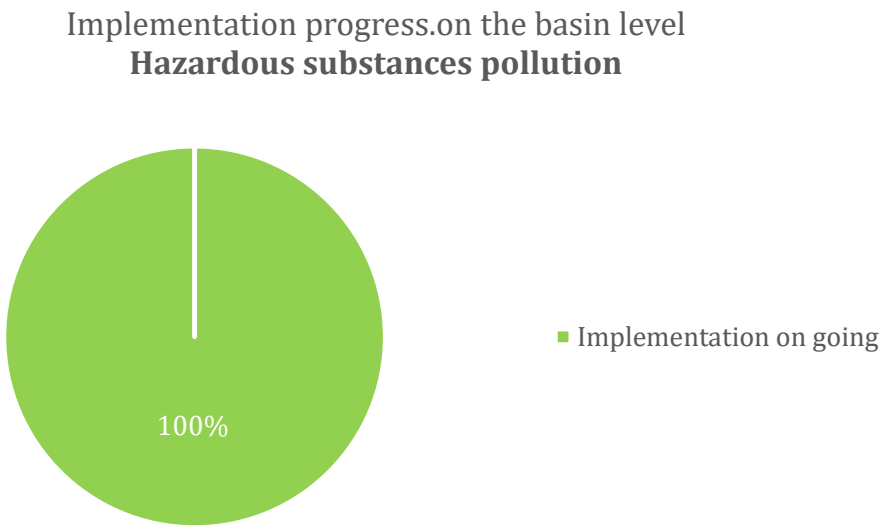


Figure 12: Implementation progress of measures for hazardous substances pollution Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 100% of the measures for hazardous substances pollution have status *Implementation ongoing*, as it is presented in Figure 12.

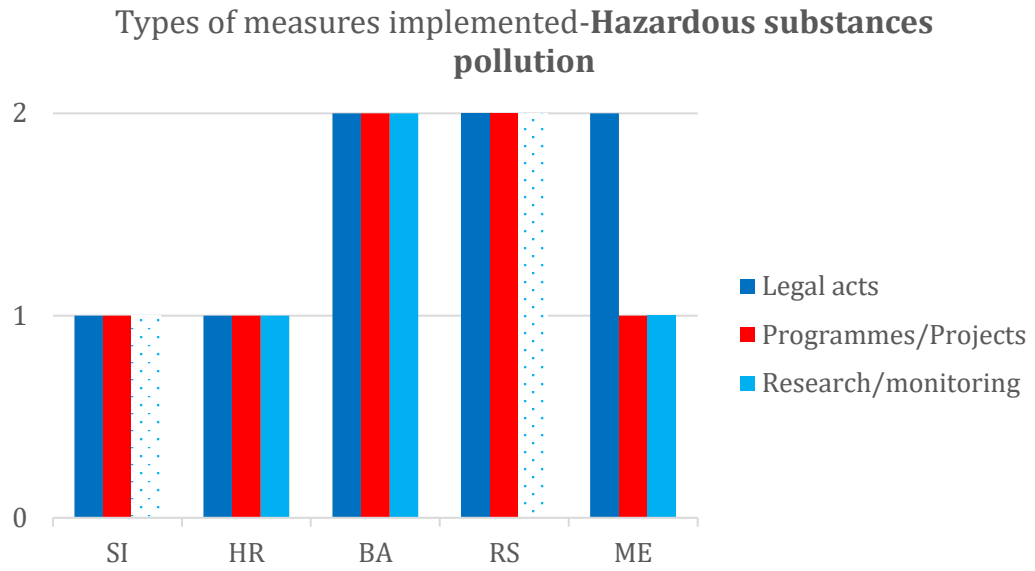


Figure 13: Types of measures implementation -hazardous pollution (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 13, the type of measures implemented addressing the hazardous substances pollution in the Sava countries are presented. *Legal acts* are used as the type of measures for all measures in all Sava countries. Through *Programmes/Projects* measures are carried out for all measures in SI, HR, BA and RS and for one measure in ME. Type of measures *Research/Monitoring* is applied for one (1) measure in HR, all measures in BA, and for one (1) measure in ME.

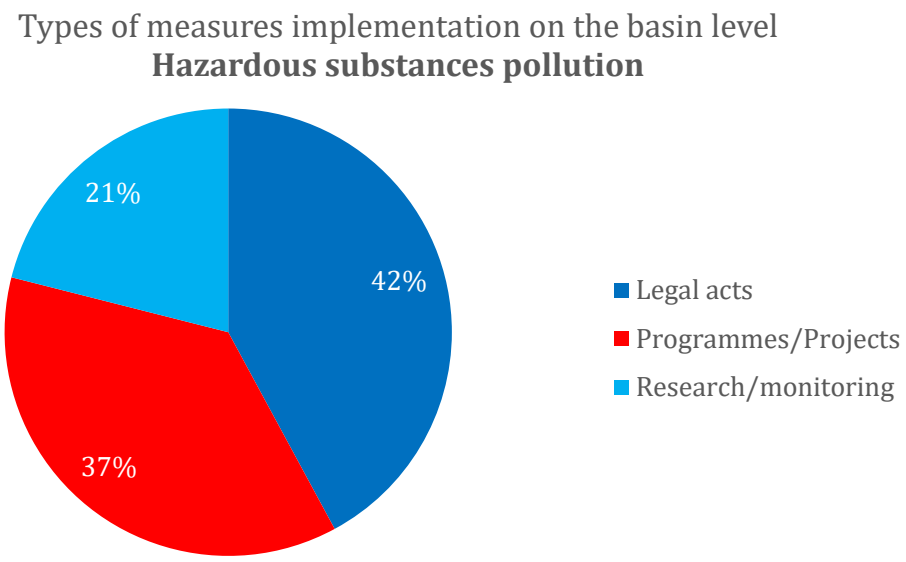


Figure 14: Types of measures implemented for hazardous substances pollution on the Sava River Basin level

In Figure 14, the share of types of measures implemented to address hazardous substances pollution is presented for the Sava River Basin level.

Detail information regarding types of measures implemented on the Sava countries' level can be found in Annex III.

4.4 Hydromorphological Alteration

4.4.1 Interruption of river and habitat continuity

Measures in the 2nd Sava RBM Plan, as steps towards the achievement of the management objectives for HYMO alteration-interruption of river and habitat continuity, to be implemented according to a timeframe which is realistic and acceptable for each of the Sava countries, are defined as:

- Specification of number and location, funding needs and funding sources for building of fish migration aids and other measures to achieve/improve river continuity which are intended to be implemented by 2021/2027 by the Sava countries (the 2015 deadline applies to Slovenia as an EU MS);
- Specification of locations, extent and measures type, funding needs and funding sources for restoration, conservation and improvements of habitats which are intended to be implemented by 2021/2027 by the Sava countries (the 2015 deadline applies to Slovenia as an EU MS)[3]
- Construction of fish migration aids and/or other measures to achieve/improve river continuity in the Sava River and its tributaries to safeguard reproduction and the self-sustaining of migratory species;
- Restoration, conservation and improvements of habitats and their continuity for migratory species in the Sava River and its tributaries.

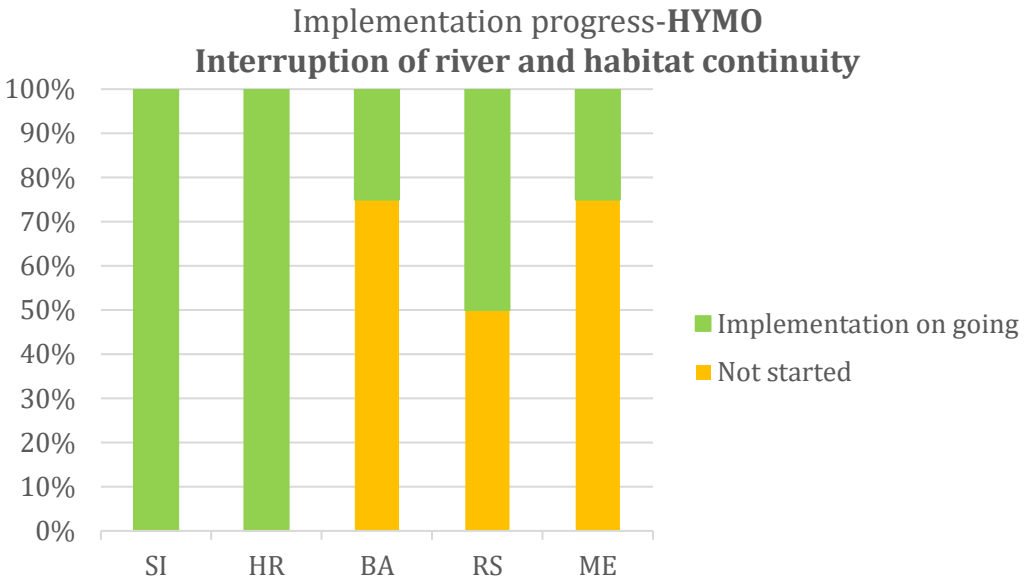


Figure 15: Implementation progress of measures for - HYMO-Interruption of river and habitat continuity (country level)

Considering measures for HYMO Alterations-Interruption of river and habitat continuity (four (4) common measures defined) implementation progress is as shown in Figure 15.

[3] *Until 2015 it was possible to prepare projects for immediate implementation. Assessing funding needs for the implementation of measures and identifying funding sources are crucial steps. If countries commit themselves to this, it will also help create pressure on the European Commission and the Council to allocate sufficient funds to these measures in future funding programmes for the EU and Accession countries in particular in Cohesion Policy and IPA programmes.*

Implementation on going is indicated for all measures in SI and HR, two (2) measures for RS and for one (1) measure in BA and ME. Implementation status for three (3) measures in BA and ME and two (2) measures in RS is shown as *Not started*. Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

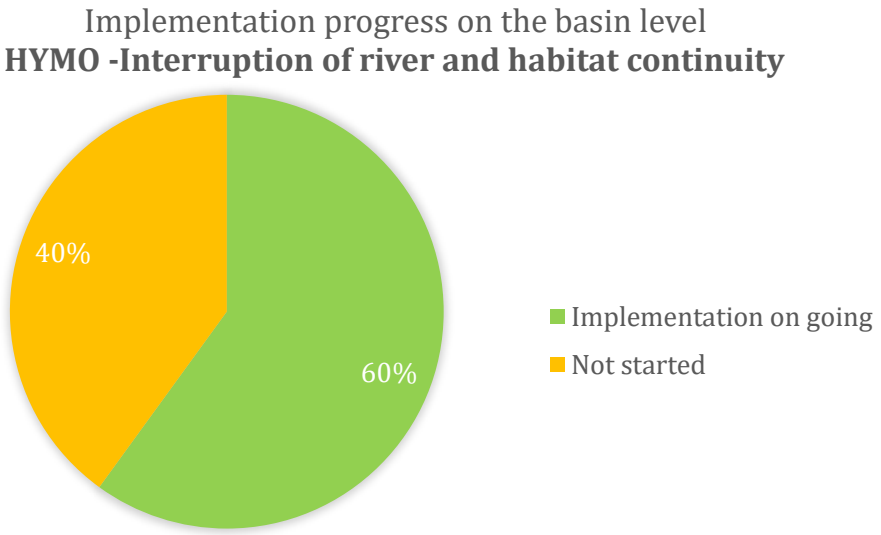


Figure 16: Implementation progress of measures for HYMO-Interruption of river and habitat continuity on the Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 60% of the measures for HYMO alteration-Interruption of river and habitat continuity have status *Implementation ongoing*, while 40% of measures have status *Not started*, as is presented in Figure 16.

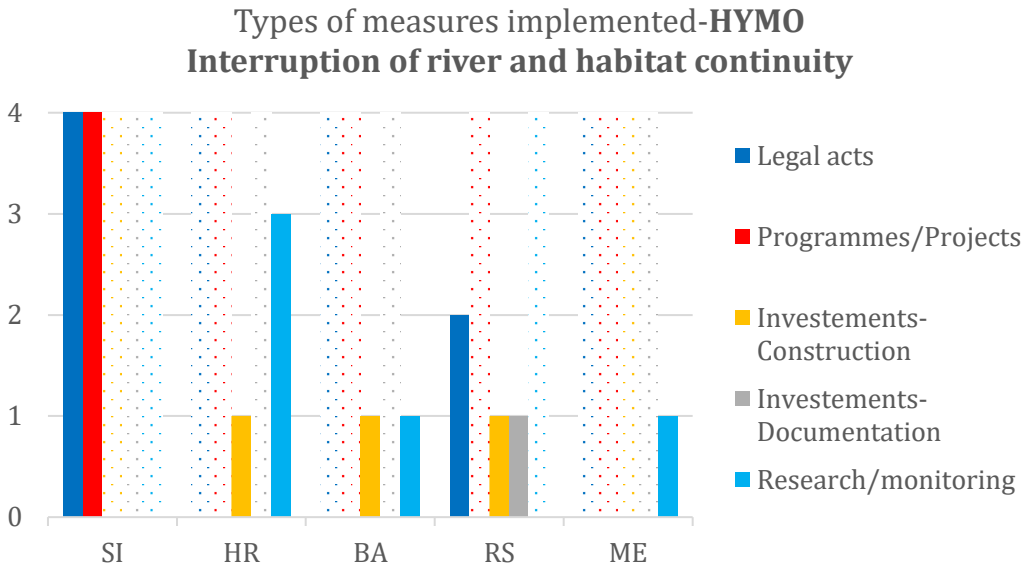


Figure 17: Types of measures implementation-Interruption (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 17, type of measures implemented addressing HYMO alterations-Interruption of river and habitat continuity in the Sava countries are presented. *Legal acts* are used as type of measures for all four measures in SI and for two (2) measures in RS. Through *Programmes/Projects* measures are carried out for all measures in SI. Type of measures *Investments-Construction* is used for one (1) measure in HR, BA and RS. *Investments - Documentation* is applied for one (1) measure in RS. In HR three (3) measures, and one (1) in BA and ME are implemented by *Research/Monitoring*.

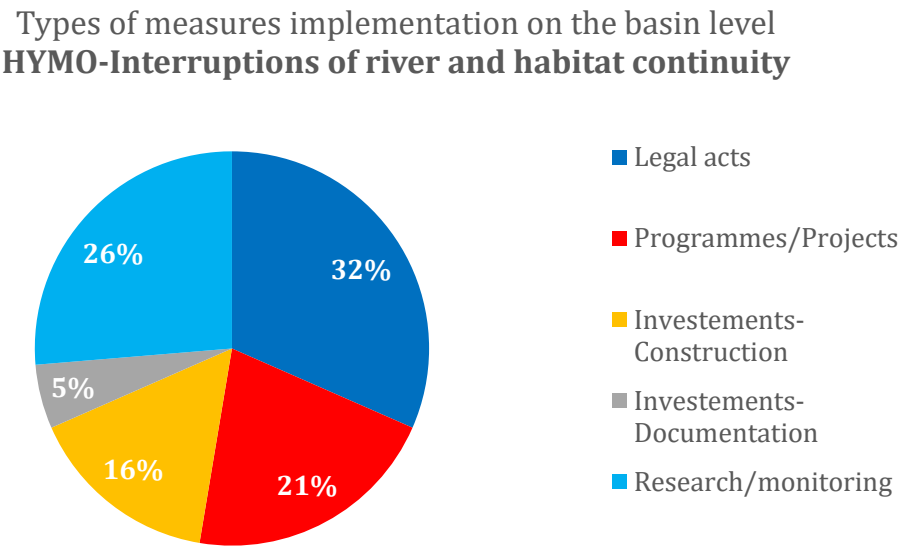


Figure 18: Types of measures implemented for HYMO -Interruption of river and habitat continuity, on the Sava River Basin level

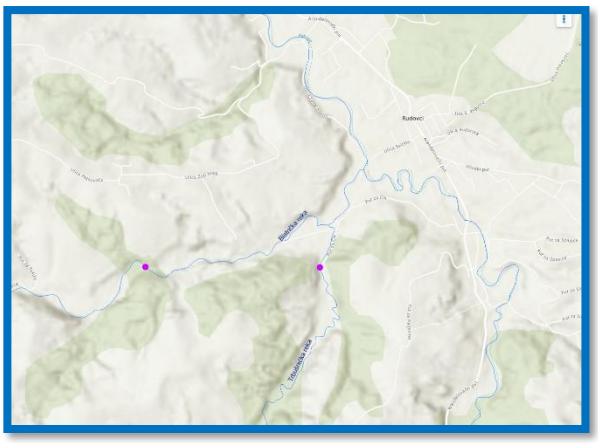
In Figure 18, the share of types of measures implemented to address HYMO alteration pressures-Interruption of river and habitat continuity is presented for the Sava River Basin level.

Detail information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

Light-house project Republic of Serbia

The frequency and severity of floods in the Kolubara River Basin, particularly after the flood in May 2014, highlighted the urgent need to enhance flood protection and improve flood risk management in line with regional, spatial and economic development requirements. In response, the Study on Improving Flood Protection in the Kolubara Basin was conducted. Following a comprehensive assessment of the existing conditions and hydrological and hydraulic analyses, the construction of 20 retention reservoirs on tributaries were proposed in order to control peak flows, reconstruction of certain embankments, anti-erosion measures, and a broad range of non-structural flood management measures.

Simultaneously, the continued expansion of coal mining operations in the Kolubara lignite basin necessitates the development of new open-pit mines. The flood protection measures for one of the key future mining sites (Field "E") involve the regulation of the Peštan River in the future mining area and the control of floodwater runoff through the construction of five retention dams, Kruševica and Rudovci on the Peštan River, and Bistrica, Trbušnica, and Darosavica on their respective rivers. As of 2024, two of the five planned dams have been completed (Bistrica and Trbušnica dam).



Location on dams on the Bistrica and Trbušnica rivers

Beyond flood protection, ensuring the ecological continuity of river habitats in accordance with the EU Water Framework Directive and national water legislation remains a priority. The rivers of the Kolubara Basin support diverse fish populations, whose habitats are at risk due to flow alterations and dam construction. To mitigate these impacts, fish passages have been constructed at the Bistrica and Trbušnica dams. These structures maintain the connectivity of aquatic ecosystems, allowing fish migration and supporting biodiversity despite hydrological modifications.

The „Bistrica" dam

The „Trbušnica" dam

4.4.2 Hydrological alteration-water abstraction

In the 2nd Sava RBM Plan, measures as steps towards the achievement of the management objectives for HYMO alteration-Water abstraction were formulated for all Sava countries as:

- Ensure sufficient residual flow downstream of a water abstraction, meeting ecological flow requirements (i.e., for ensuring habitat conditions or for meeting good status in the section influenced by water abstraction).

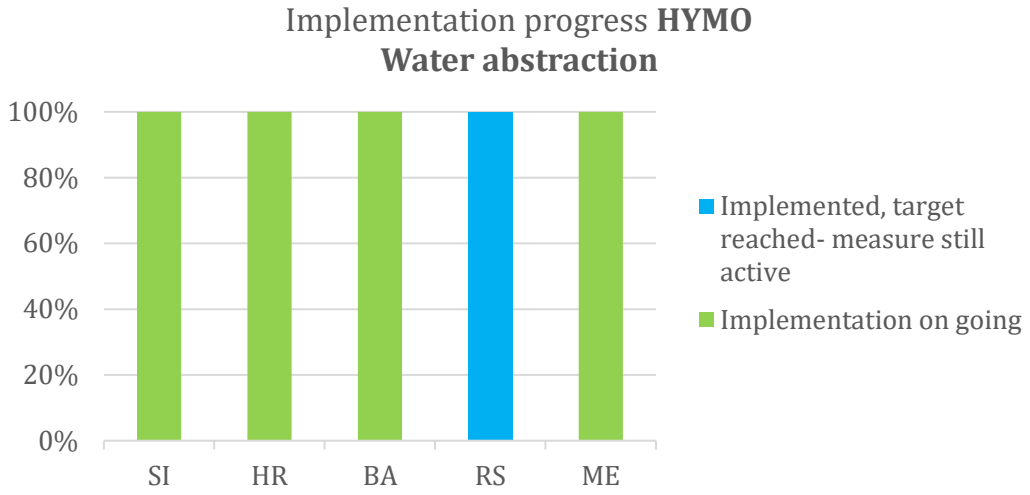


Figure 19: Implementation progress of measures for HYMO-Water abstraction (country level)

Considering measures for HYMO alterations-Water abstraction (one (1) measure is commonly defined for the Sava countries) implementation progress as shown in Figure 19. Implementation ongoing status is indicated for SI, HR, BA, and ME. Status of implementation is for RS defined as *Implemented, target reached-maintenance of the results will continue, measure still active*. Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

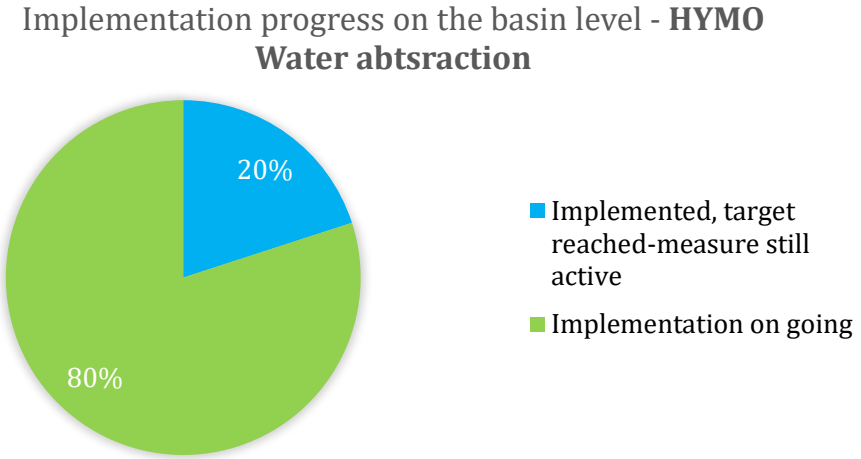


Figure 20: Implementation progress of measures for HYMO-Water abstraction on the Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 80% of the measures for HYMO alteration-Water abstraction have status *Implementation ongoing*, while 20% of measures have status *Implemented, target reached maintenance of the results will continue, measure still active,* as it is presented in Figure 20.

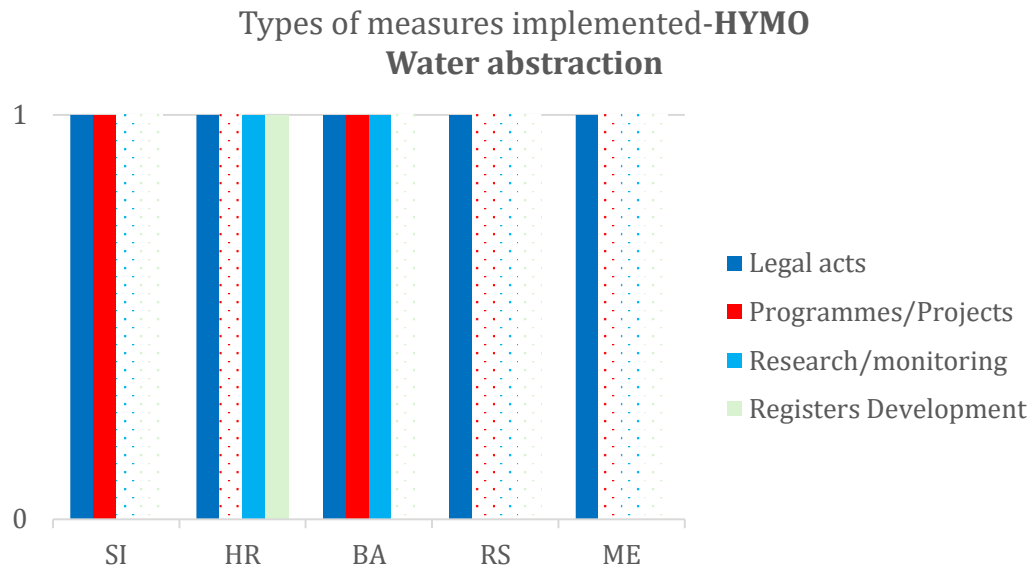


Figure 21: Types of measures implementation-Water abstraction (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 21, types of measures implemented addressing the HYMO alterations-Water abstraction in the Sava countries are presented. *Legal acts* are used as type of measures in all Sava countries. Additionally *Programme/Projects* are type of measure implementation in SI and BA, while type of measure *Research/Monitoring* is implemented in HR and BA. Additionally type of measures *Registers development* is carried out in HR.

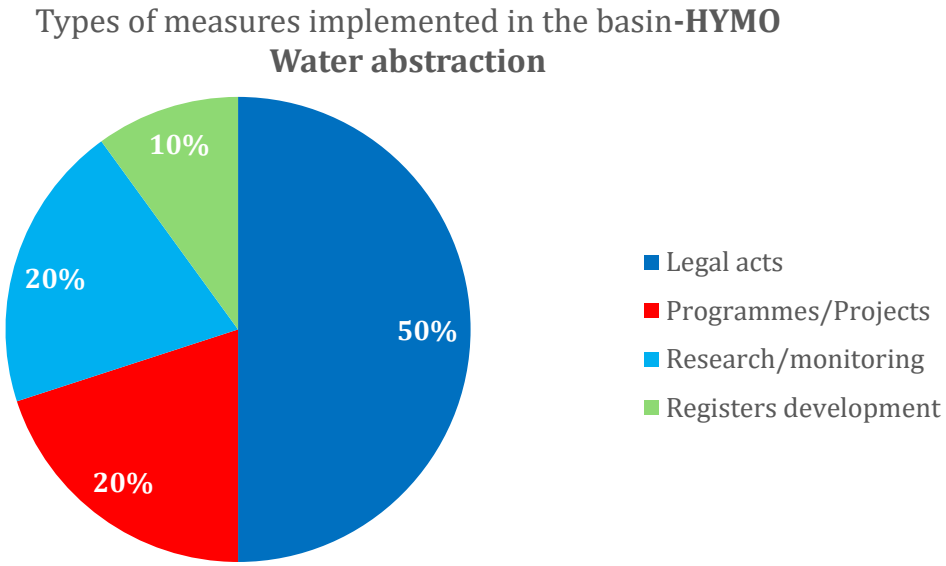


Figure 22: Types of measures implemented for HYMO pressure-Water abstraction, on the Sava River Basin level

In Figure 22, the share of types of measures implemented to address HYMO pressure-Water abstraction is presented for the Sava River Basin level.

Detailed information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

4.4.3 Hydrological alteration-Impoundment

In the 2nd Sava RBM Plan, measure as step towards the achievement of the management objectives for HYMO alteration-Impoundment was formulated for all Sava countries as:

- morphologically restructuring the sections of impoundments

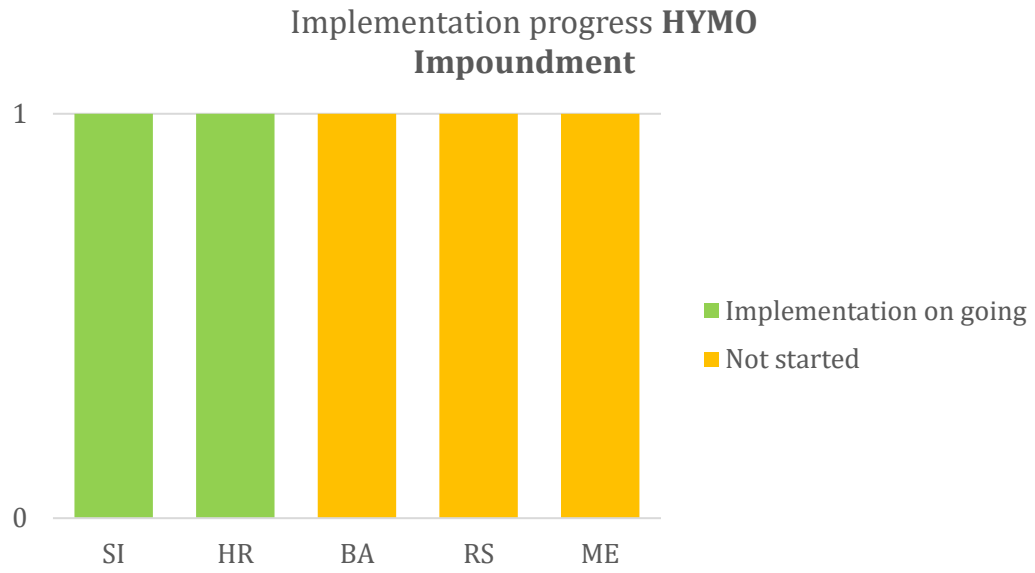


Figure 23: Implementation progress of measures for HYMO -Impoundment (country level)

Considering measures for HYMO alterations-Impoundment (one measure is commonly defined for the Sava countries) implementation progress as shown in Figure 23. *Implementation ongoing* status is indicated for SI, HR, while in BA, RS and ME, implementation of measures addressing the HYMO Alterations-Impoundment is *Not started*. Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

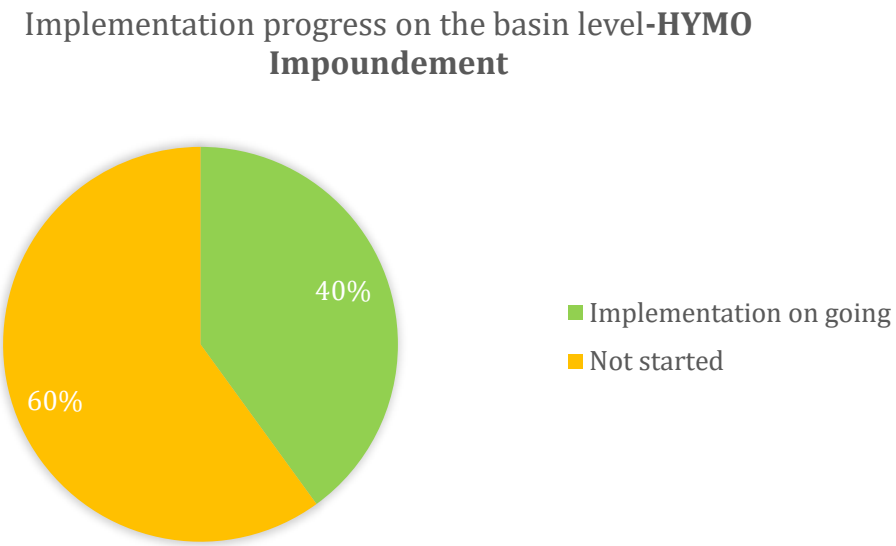


Figure 24: Implementation progress of measures for HYMO-Impoundment on the Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 40% of the measures for HYMO alteration- Impoundment, have status *Implementation ongoing*, while 60% of measures have status *Not started*, as it is presented in Figure 24.

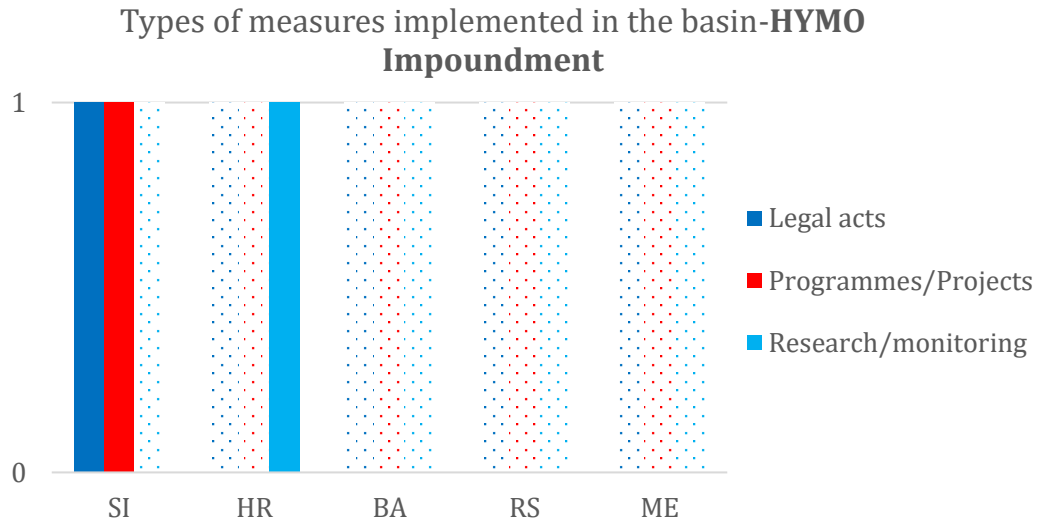


Figure 25: Types of measures implementation-Impoundment (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 25, types of measure implemented addressing the HYMO alterations-Impoundment in the Sava countries are presented. In SI, measure is implemented by *Legal Acts* and *Programmes/Projects*, while in HR by *Research/Monitoring* type of action.

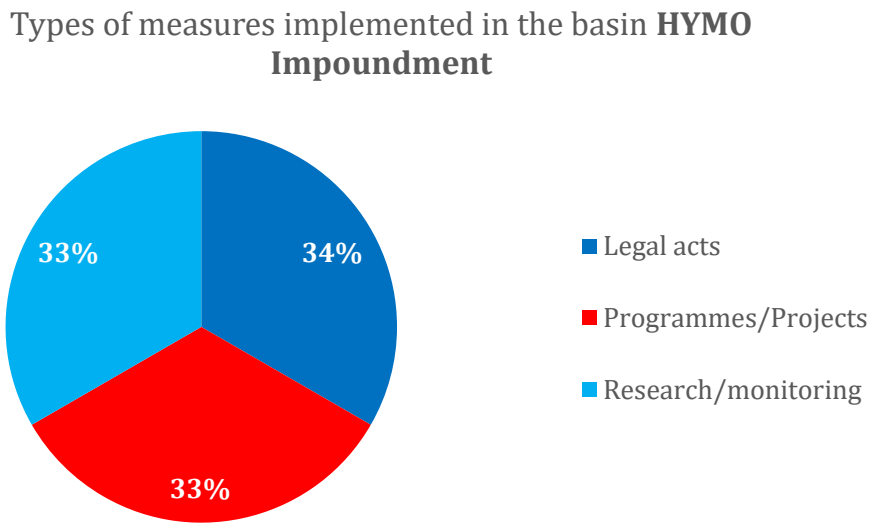


Figure 26: Types of measures implemented for HYMO pressure-Impoundment, on the Sava River Basin level

In Figure 26, the share of types of measures implemented to address HYMO pressure-Impoundment is presented for the Sava River Basin level.

Detailed information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

4.4.4 Hydrological alteration-hydropeaking

In the 2nd Sava RBM Plan, measure as steps towards the achievement of the management objectives for HYMO alteration-Hydropeaking was formulated for all Sava countries as:

- improvement of operational modifications of the reservoir operators

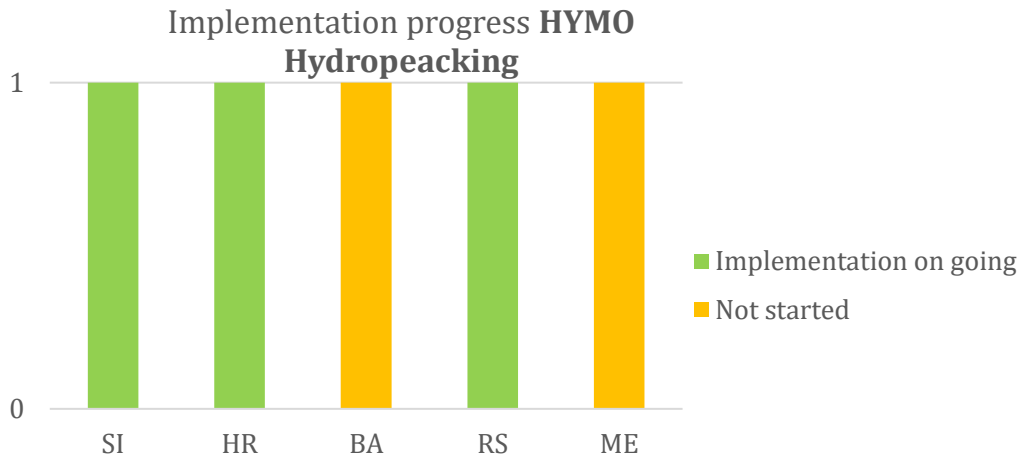


Figure 27: Implementation progress of measures for-HYMO-Hydropeaking (country level)

Considering measures for HYMO alterations-Hydropeaking (one (1) measure is commonly defined for the Sava countries) implementation progress as shown in Figure 27. *Implementation ongoing* status is indicated for SI, HR, and RS, while in BA, and ME,

implementation of measures addressing the HYMO Alterations- Hydropeaking is shown as *Not started*. Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

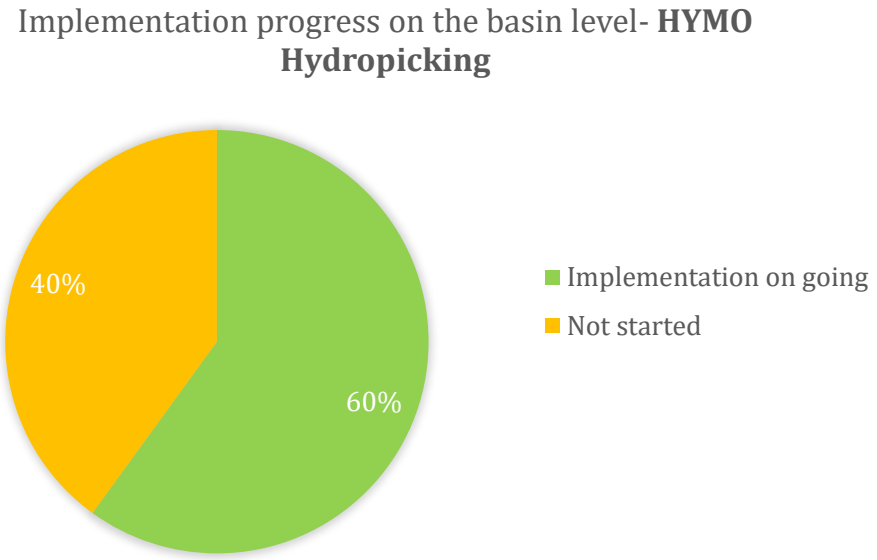


Figure 28: Implementation progress of measures for HYMO -Hydropeaking, Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 60% of the measures for hydromorphological alteration-Hydropeaking have status *Implementation ongoing*, while 40% are indicated as *Not started*, as it is presented in Figure 28.

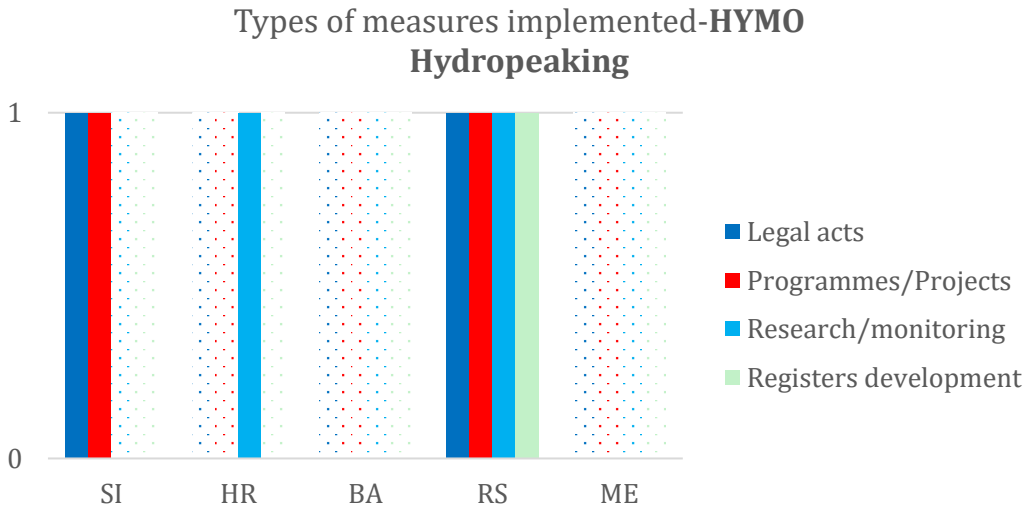


Figure 29: Types of measures implementation-hydropeaking (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 29, types of measure implemented addressing the HYMO alterations-Hydropeaking in the Sava countries are presented. By Legal Act, and *Programmes/Projects* measures are implemented in SI and RS. *Research/Monitoring* is a type of action

implemented in HR and RS. Additionally, measure is implemented in RS by *Registers development*.

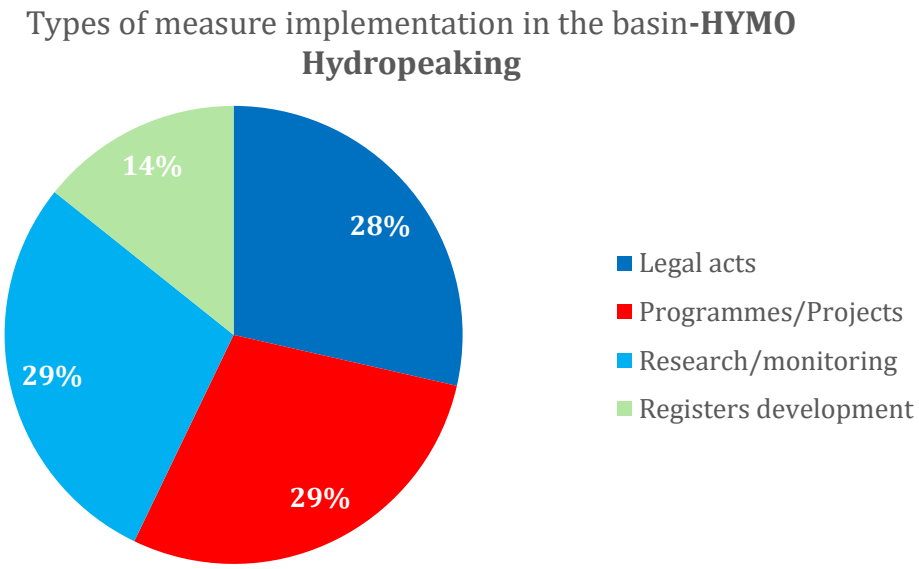


Figure 30: Types of measures implemented for HYMO pressure-Hydropeaking, on the Sava River Basin level

In Figure 30, the share of types of measures implemented to address HYMO alteration-Hydropeaking is presented for the Sava River Basin level.

Detailed information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

4.4.5 Morphological alteration

In the 2nd Sava RBM Plan, measure as step towards the achievement of the management objectives for HYMO-Morphological alteration was formulated for all Sava countries as:

- restoration of natural river morphology where possible and, if it is not possible, implementation of the "no net-loss" principles.

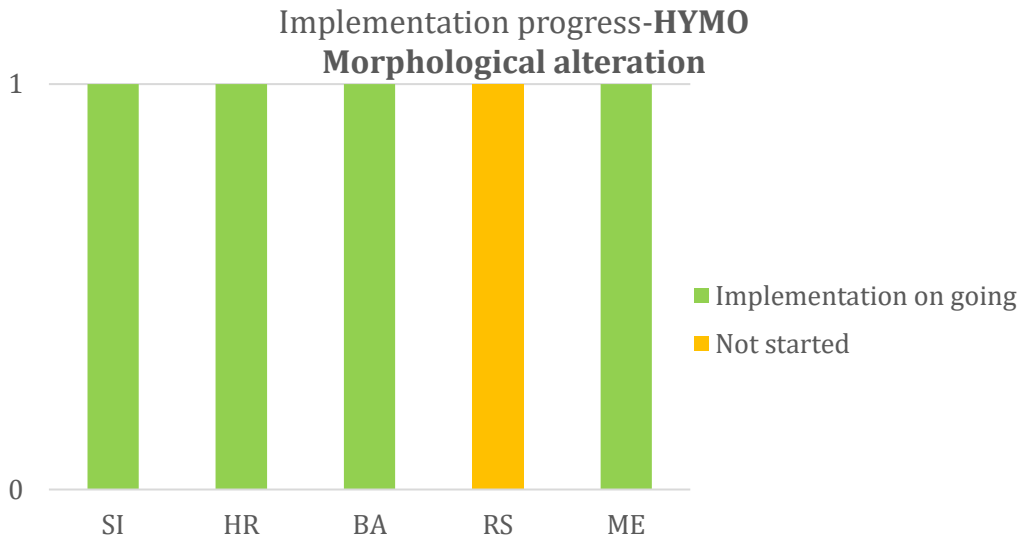


Figure 31: Implementation progress of measures for HYMO -Morphological Alteration (country level)

Considering measures for HYMO alterations-Morphological alterations (one measure is commonly defined for the Sava countries) implementation progress as shown in Figure 31. *Implementation ongoing* status is indicated for SI, HR, BA (only in BA_Fed), and ME. Implementation of the measure has not yet started in RS. Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

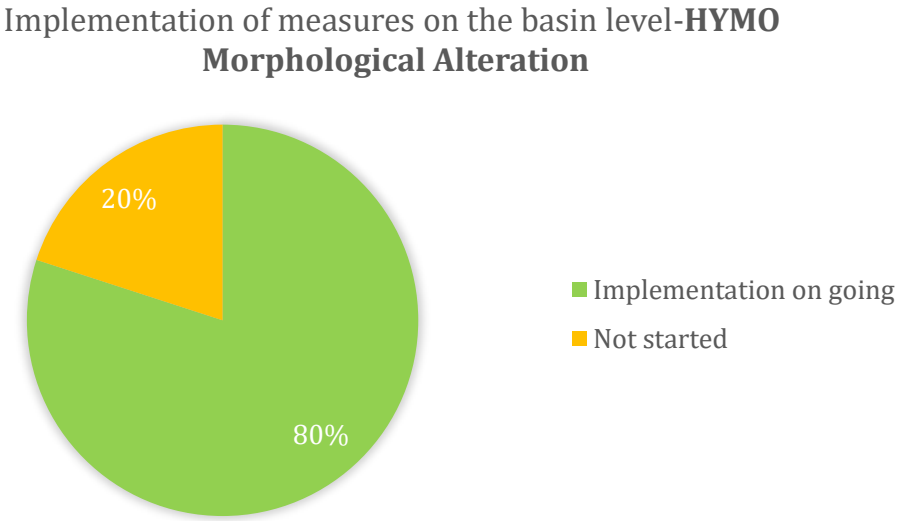


Figure 32: Implementation progress of measures for HYMO -Morphological Alteration-Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 80% of the measures for HYMO alteration-Morphological alteration have status *Implementation ongoing*, while in 20% is indicated as *Not started*, as it is presented in Figure 32.

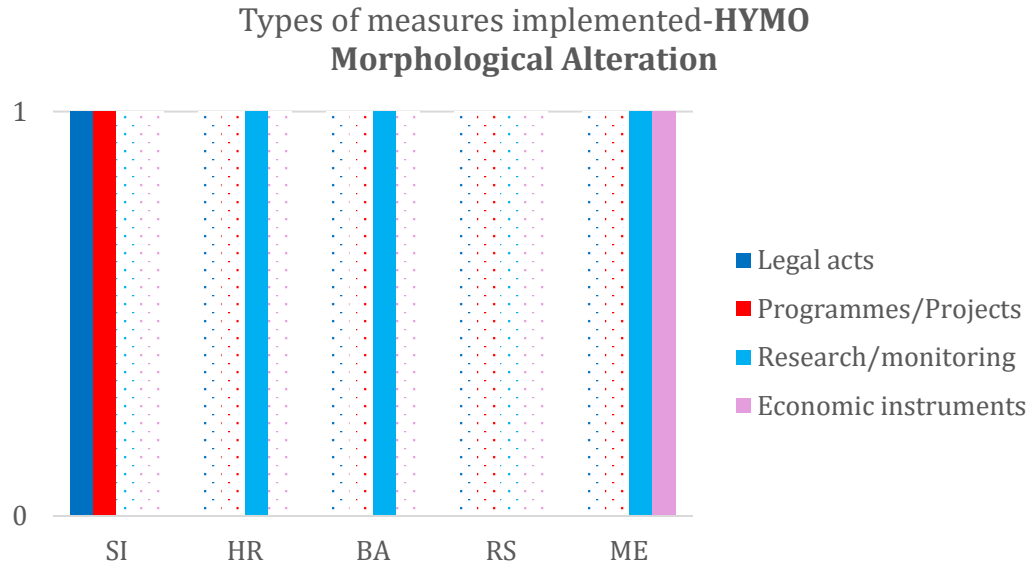


Figure 33: Type of measures implementation-Morphological alterations (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 33, types of measure implemented addressing the hydromorphological alterations-morphological alterations in the Sava countries are presented. In SI, a measure is implemented by *Legal Acts* and *Programmes/Projects*, while *Research/Monitoring* type of action are carried out in HR, BA (only in BA_Fed) and ME. Additionally in ME, measure is implemented using *Economic instruments*.

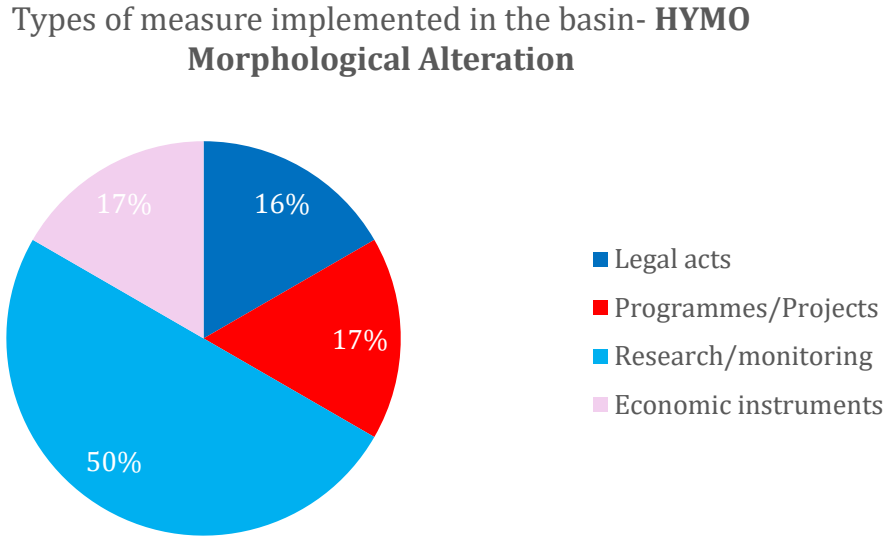


Figure 34: Types of measures implemented for HYMO pressure-Morphological Alteration, on the Sava River Basin level

In Figure 34, the share of types of measures implemented to address HYMO pressure-Morphological alteration is presented for the Sava River Basin level.

Detailed information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

To more specifically define steps that could be undertaken for improvement of the morphological conditions in the Sava River Basin, a set **supplementary measures is defined for HYMO issue-Morphological alteration** and comprise following set of actions (i) Law enforcement regarding riparian zone maintenance, (ii) Control over sand and gravel extraction, (iii) Avoiding reduction of floodplain size, (iv) Additional investigations are needed to define the causes of morphological quality deterioration, (v) restoration of the meandering character of the river, (vi) restoring and mitigating the effects of dredging and (vii) planting of natural vegetation along the river courses.

In all countries in the Sava basin some of these actions are in implementation as follows, action (i) in SI, HR and ME, by *Legal acts*, action (ii) in SI, HR, RS and ME by *Legal acts*, action (iii) by *Research/Monitoring* in HR and legal act in ME, action (iv) in RS and ME by *Research/Monitoring*, and additionally in RS by *Programmes/Projects* and *Registers development* as well. Action (v) is in implementation in ME by *Research/Monitoring*, while action (vi) is in implementation in RS and ME by *Programmes/Projects*, and additionally in RS by *Legal acts* and *Research/Monitoring*. Action (vii) is implemented in ME by *Research/Monitoring*. For BA no information related to implementation of the supplementary measures for HYMO-Morphological alterations were available.

that contribute to improvement of ground water quality are considered some measures already addressing pollution related SWMIs, and comprising of: Implementation of the management objectives described for organic and nutrient pollution of surface water, Increase of wastewater treatment efficiency, Implementation of Best Available Techniques and Best Environmental Practices, and Reduction of pesticide/biocides emission in the Sava River Basin, that are all in implementation status as indicated in pollution chapters.

Light-house project Republic of Slovenia

The Mali Graben - flood management project

Slovenia has made significant progress in implementing nature-based solutions (NbS) for water management, incorporating green infrastructure, wetland restoration, and sustainable flood mitigation strategies. Slovenia's approach to NbS in flood protection has evolved from expert-based assessments to structured hydromorphological studies, introduced in 2017. In 2022, updates to the ***General Guidelines for Water Management*** *– Annex 3 established hydromorphological studies (HMŠ) as a formal requirement for assessing the impact of physical interventions, ensuring alignment with environmental objectives. Recent efforts further integrate NbS, emphasizing river continuity, floodplain restoration, and green infrastructure. These advancements support ecological sustainability, climate resilience, and EU water policies.*

The Mali Graben flood management project is part of the broader Gradaščica River Basin Flood Protection Plan, co-financed by Slovenia and the EU. It aims to reduce flood risks in southwest Ljubljana and surrounding settlements by improving water flow capacity and implementing sustainable flood protection measures. The project combines infrastructure with nature-based solutions, ensuring effective flood mitigation while enhancing biodiversity and environmental resilience.

The B4 section of the Mali Graben is the 905-meter-long section extends from the bridge at Cesta v Mestni log to the intersection of Mali Graben and the southern Ljubljana ring road. The main intervention involved expanding the high-water channel with terraces on both banks, ensuring adequate flood conveyance while maintaining the existing low-water channel.

Key nature-based measures include: ***(i)*** *Gradual slope excavation (1:10 to 1:20) to create floodplain terraces, enhancing water retention and biodiversity.* (ii) *Preservation of the natural streambed, reinforcement and rehabilitation of the bank protection using rock fragments and anchoring with piles were carried out along the entire section. The protection was implemented in a distinctly irregular and varied form (rough arrangement) to allow the creation of pools and fish shelters among the rocks.* ***(iii)*** *Riparian vegetation restoration, ensuring native plant growth and soil stability.* ***(iv)*** *Minimized impact on water quality and hydrology, supporting local ecosystems while improving flood resilience.*

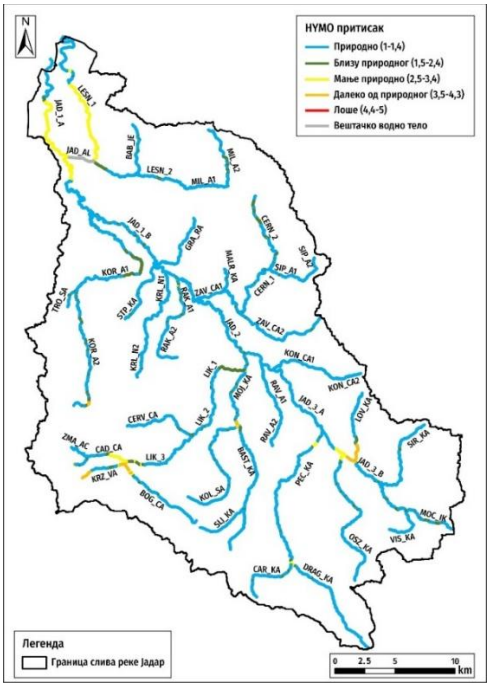
Light-house project Republic of Serbia

During the preparation of the first River Basin Management Plan for the territory of the Republic of Serbia, which refers to the planning cycle 2021-2027, a methodology was adopted for the assessment of hydromorphological pressures, according to which only a qualitative assessment of hydromorphological parameters was applied, due to lack of the necessary data for application of quantitative assessment.

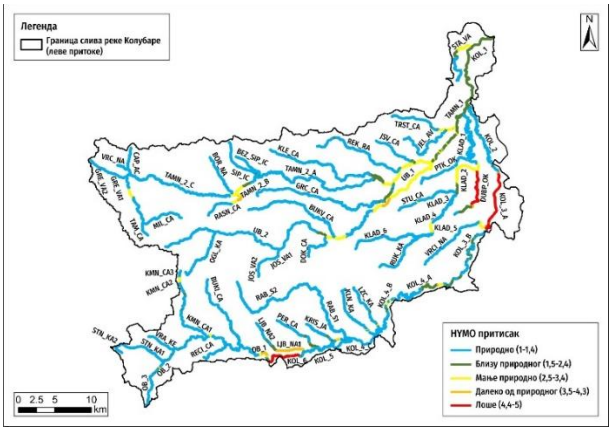
In order to overcome this gap, after the adoption of the RBMP, a study was carried out with a main task to apply the quantitative assessment of hydromorphological parameters and to determine the methodology for further assessment of hydromorphological parameters. Quantitative assessment of hydromorphological parameters was analyzed on water bodies for watercourses with a catchment area of more than 10 km² in the pilot basin of the Jadar River.

In addition to the assessment of hydromorphological pressures and risk assessment, a comparative analysis of the results obtained was carried out in relation to the assessment of hydromorphological parameters given in the RBMP, with a proposal for possible future application for the entire territory of the Republic of Serbia.

In accordance with the methodology confirmed in the study, a quantitative assessment of hydromorphological parameters was made for all left tributaries of the Kolubara River (on water bodies for watercourses with a catchment area of more than 10 km²), and an assessment of the right tributaries will be done by the end of 2024, which will complete the data for the Kolubara River. It is planned to continue with the quantitative assessment of hydromorphological parameters in the coming years, on other watercourses in the territory of the Republic of Serbia. The collected data will be stored in a newly created database and will be used to assess hydromorphological pressures for the next RBMP planning period.



HYMO pressures on the water bodies in the Jadar River basin



HYMO pressures on the water bodies in the Kolubara River basin (the left tributaries only)

4.4.6 Future infrastructure projects

In the 2nd Sava RBM Plan, measures as steps towards the achievement of the management objectives for the HYMO-Future Infrastructure Projects were formulated for all Sava countries as:

- Conduction of an Environmental Impact Assessment (EIA) and/or a Strategic Environment Assessment (SEA) in conjunction with the requirements of WFD Article 4(7) during the planning phase of future infrastructure projects if required;
- Fulfilment of the conditions set out in WFD Article 4, in particular the provisions for new modifications specified in Article 4, Paragraph 7;
- Recommendations for stakeholders regarding the implementation of the best environmental practices and the best available techniques.

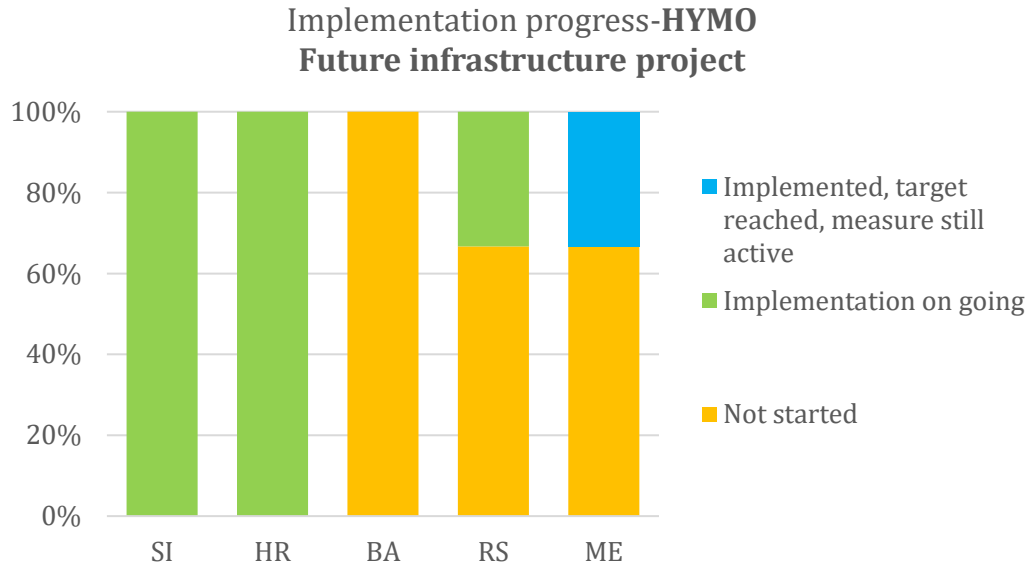


Figure 35: Implementation progress of measures for HYMO -Future Infrastructure Projects (country level)

Considering measures for HYMO alterations- Future Infrastructure Projects (set of three (3) measures commonly defined for the Sava countries) implementation progress as shown in Figure 35. *Implementation ongoing* status is indicated for all measures in SI, HR, and for one (1) measure in RS. Status of implementation for one (1) measure in ME is defined as *Implemented, target reached-maintenance of the results will continue, measure still active*, while for any of the measures addressing the HYMO Alterations- Future Infrastructure Projects in BA, and for three (3) measures in RS and ME implementation process has not started. Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

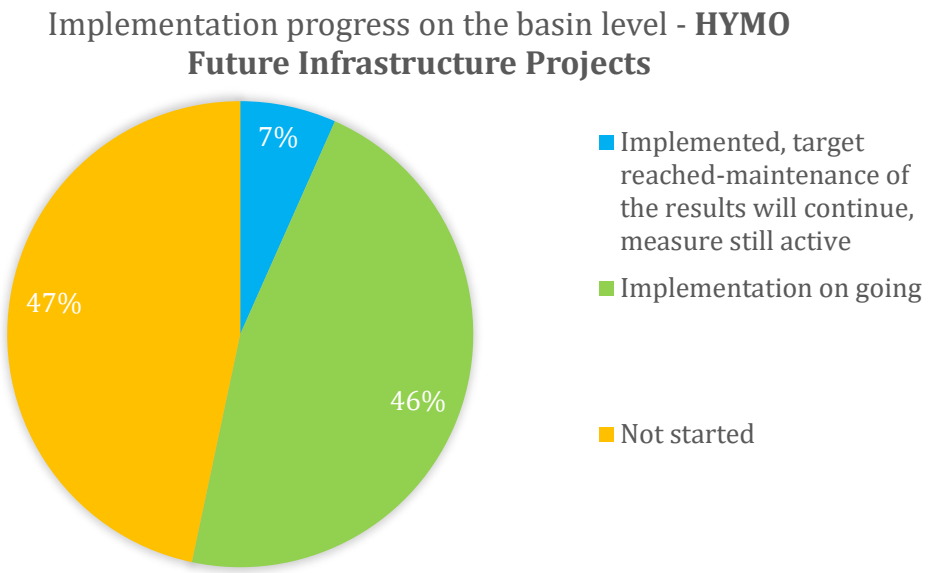


Figure 36: Implementation progress of measures for HYMO -Future Infrastructure Projects, Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 46% of the measures for Future Infrastructure Projects have status *Implementation ongoing*, 7% of measures have status *Implemented, target reached maintenance of the results will continue, measure still active*, and 47% Not started, as it is presented in Figure 36.

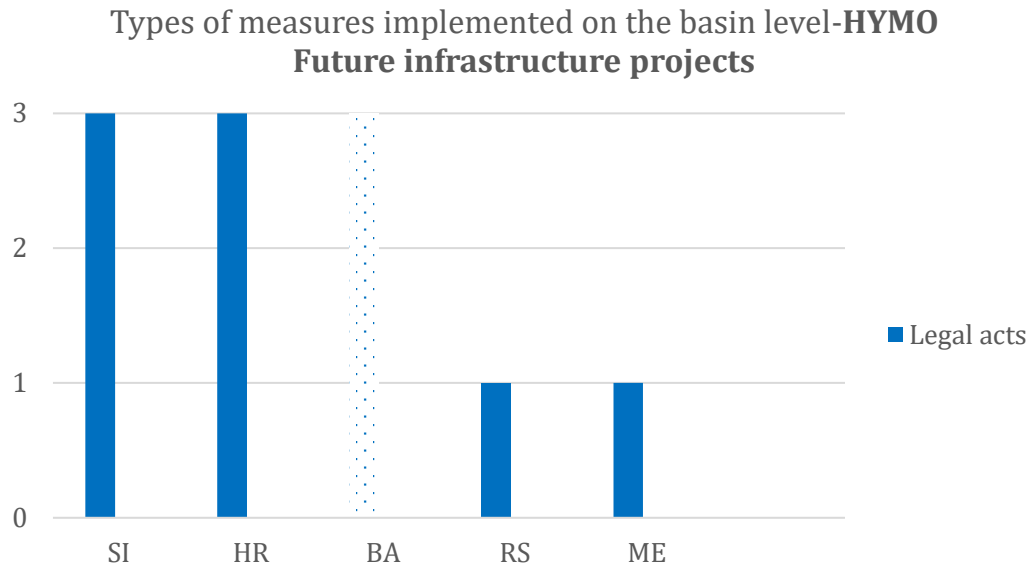


Figure 37: Types of measures implementation-Future infrastructure Projects (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 37, the type of measure implemented addressing the HYMO alterations-Future Infrastructure Projects in the Sava countries is presented. In SI, HR, RS and ME measures are implemented by *Legal Acts*.

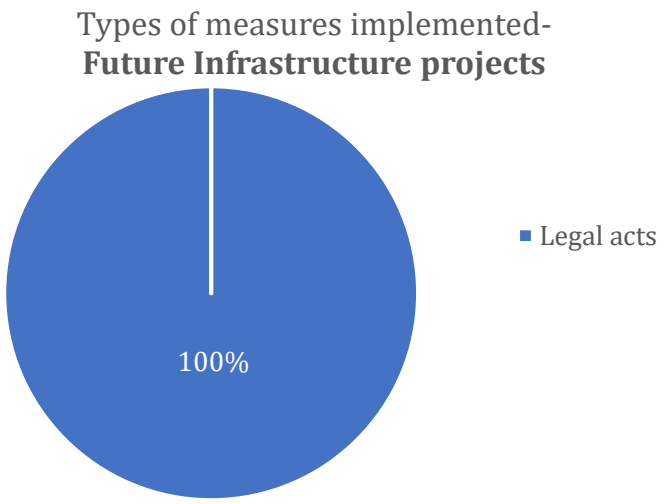


Figure 38: Types of measures implemented for HYMO pressure-Future Infrastructure Project, on the Sava River Basin level

In Figure 38, the share of types of measures implemented to address HYMO-Future infrastructure projects is presented for the Sava River Basin level.

Detailed information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

4.5 Groundwater

In the 2nd Sava RBM Plan, measures as steps towards the achievement of the management objectives for groundwater are commonly defined for all Sava countries. However, given the specific situation in the non-EU MS countries, these measures are to be implemented according to the timeframe which is realistic and acceptable for these countries. The EU MS these measures should implement according to the deadlines set down in the Accession Treaties, i.e., Slovenia Croatia until 2027.

4.5.1 Groundwater quality

In the 2nd Sava RBM Plan, measures as steps towards the achievement of the management objectives for groundwater quality were formulated for all Sava countries as:

- Implementation of the prevention / limitation of pollutants inputs into groundwater according to the Ground Water Directive (2006/118/EC);
- Implementation of the Nitrates Directive (91/676/EEC);
- Implementation of the Sustainable Use of Pesticides Directive (Directive 2009/128/EC), Plant protection directive (Regulation No.1107/2009), and Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning making available on the market and use of biocidal products;
- Implementation of the UWWT Directive (91/271/EEC);
- Implementation of the Directive on industrial emissions IED (2010/75/EC) which also relates to the Directive 2008/105/EC on environmental quality standards and Directive (2013/39/EC) related to priority substances in the field of water policy.

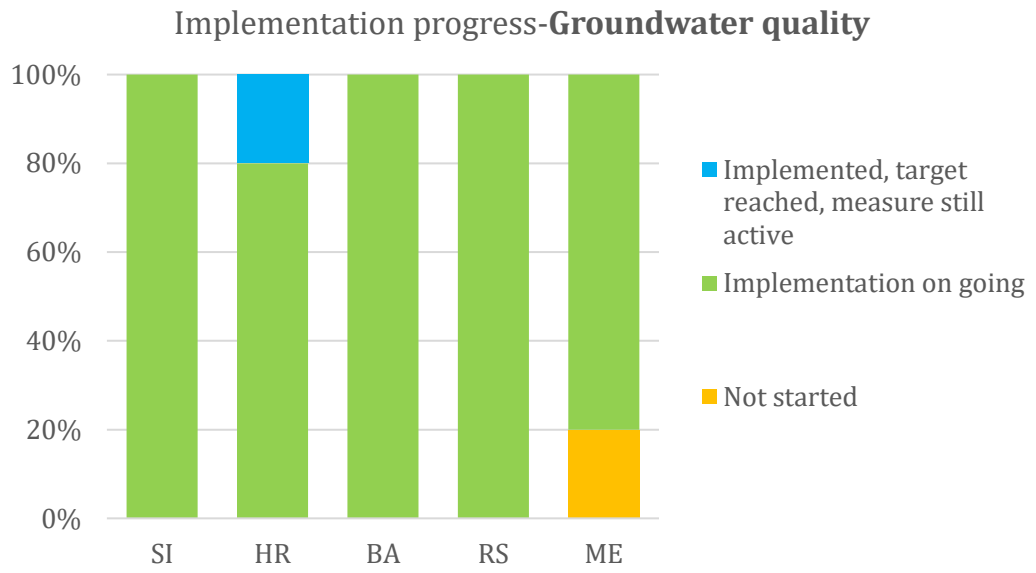


Figure 39: Implementation progress of measures for -Groundwater quality (country level)

Considering measures for groundwater quality (set of five (5) measures is commonly defined for the Sava countries) implementation progress is as shown in Figure 39. *Implementation ongoing* status is indicated for all measures in SI, BA (one (1) of five (5) only in BA_RS, and one (1) only in BA_Fed, others in both entities), and RS, and for four (4) measures in HR, and ME. Additionally, status for one (1) measure in HR, is defined as

Implemented, target reached-maintenance of the results will continue, measure still active, while in ME implementation of one (1) of the measures has not yet started. Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

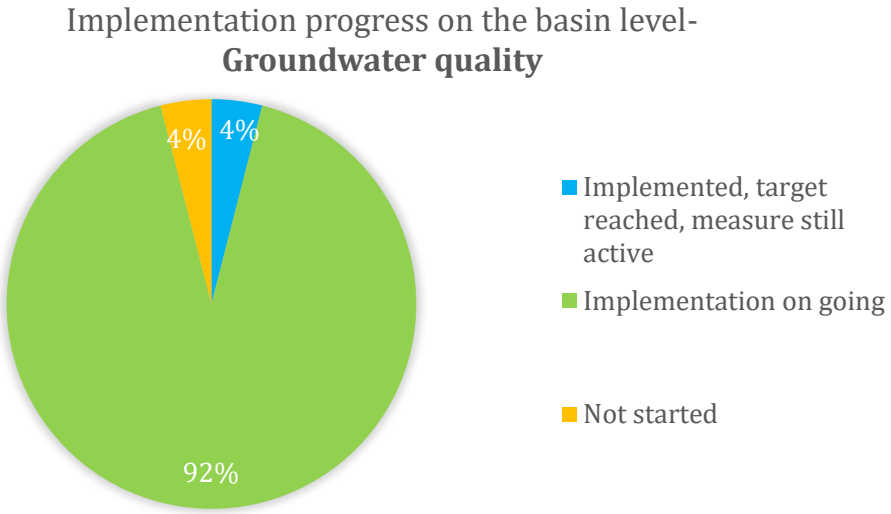


Figure 40: Implementation progress of measures for -Groundwater quality, Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 92% of the measures for groundwater quality have status *Implementation ongoing*, while 4% of measures have status *Implemented, target reached maintenance of the results will continue, measure still active*, and 4% Not started, as it is presented in Figure 40.

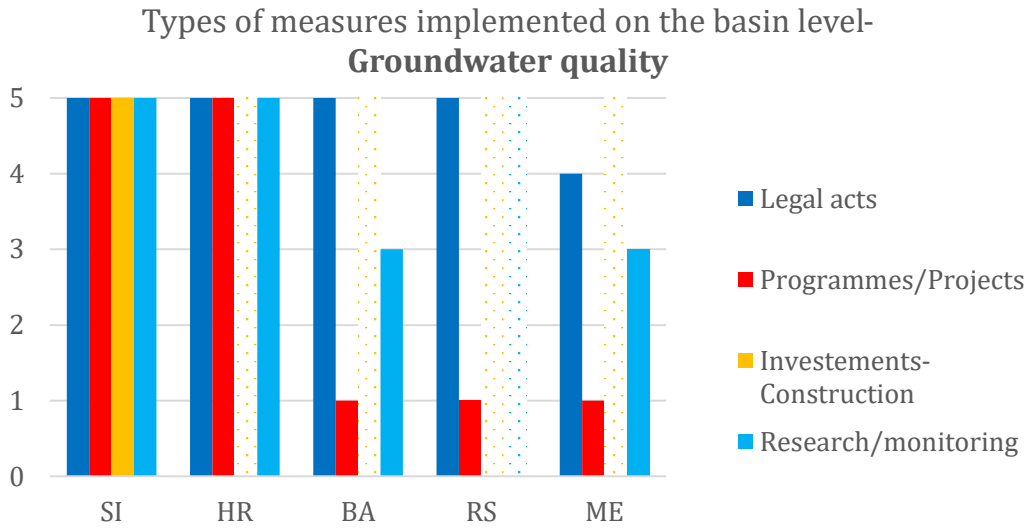


Figure 41: Types of measures implementation-groundwater quality (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 41, the types of measures implemented addressing the ground water quality in the Sava countries are presented. *Legal acts* are used as type of measures for all measures in SI, HR, BA (one (1) measure only in BA_RS, and one (1) only in BA_Fed, others in both entities) and RS, and for four (4) measures in ME. Through *Programmes/Projects* measures are carried out for all measures in SI and HR, and for one (1) measure in BA, RS and ME. Type of measures *Investments-Construction* is used for all measures in SI. All measures in SI and HR, one (1) in BA, and three (3) measures in ME are implemented by *Research/Monitoring*.

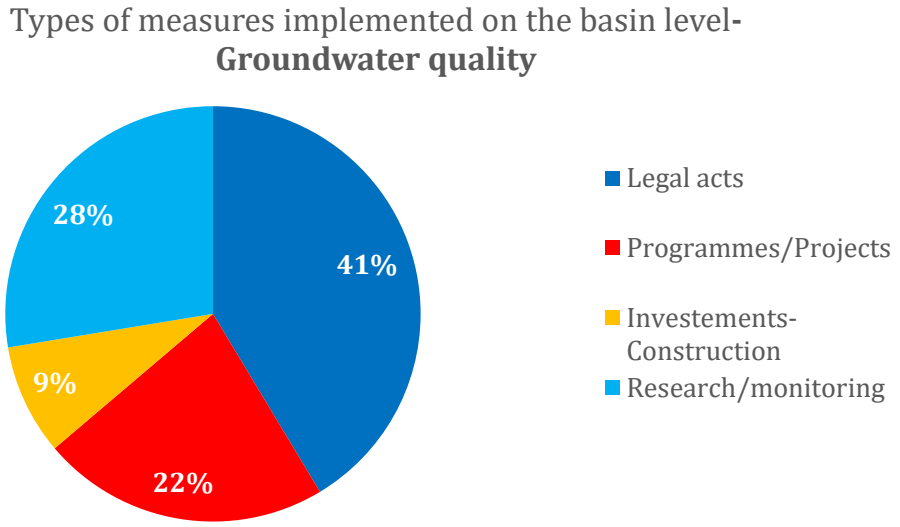


Figure 42: Types of measures implemented for groundwater quality, on the Sava River Basin level

In Figure 42, the share of types of measures implemented to address groundwater quality is presented for the Sava River Basin level.

Detailed information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

For groundwater quality issue, set of supplementary measures is developed as well. As supplementary measures are considered, some measures already addressing pollution related SWMIs that contribute to improvement of groundwater quality and comprising of: (i) Implementation of the management objectives described for organic and nutrient pollution of surface water (level of implementation and types of measures implemented elaborated in Chapter 2.1 Organic pollution, and 2.2. Nutrient pollution), (ii) Increase of wastewater treatment efficiency (Level of implementation and types of measures implemented elaborated in Chapter 2.1 Organic pollution), (iii) Implementation of Best Available Techniques and Best Environmental Practices, and Reduction of pesticide/biocides emission in the Sava River Basin (Level of implementation and types of measures implemented elaborated in Chapter 2.3 Hazardous pollution), that are all in implementation ongoing status as elaborated in the indicated chapters.

4.5.2 Groundwater quantity

In the 2nd Sava RBM Plan, measures as steps towards the achievement of the management objectives for groundwater quantity were formulated for all Sava countries as:

- Over-abstraction from GWBs within the Sava River Basin will be avoided by sound groundwater management.
- Implementation of WFD (2000/60/EC) requirements that groundwater resources are not depleted by the long-term annual average rate of abstraction.

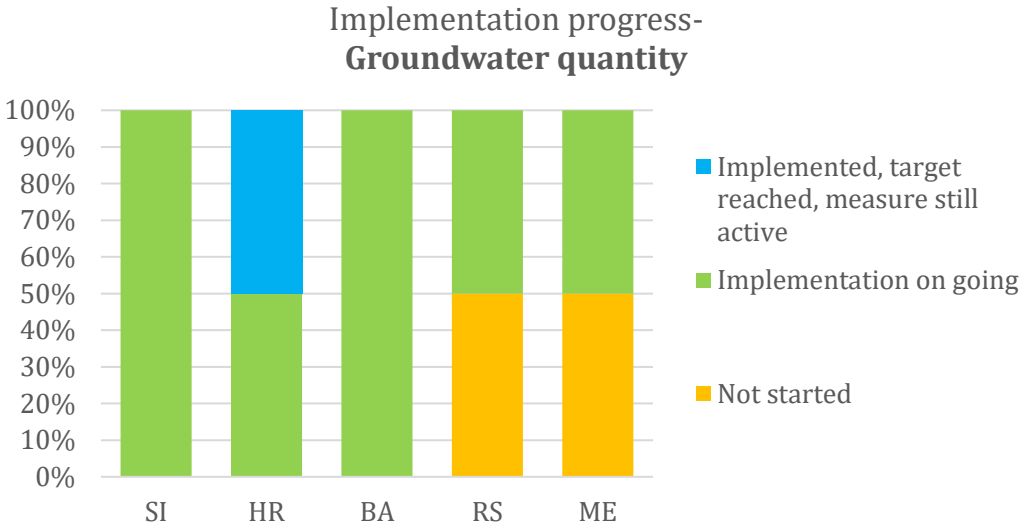


Figure 43: Implementation progress of measures for groundwater quantity (country level)

Considering measures for groundwater quantity (set of two (2) measures is commonly defined for the Sava countries) implementation progress as shown in Figure 43. *Implementation ongoing* status is indicated for all measures in SI, and BA, one measure in HR, RS and ME. One (1) measure implementation in HR has status progress indicated as *Implemented, target reached-maintenance of the results will continue, measure still active*, while implementation of one (1) measure has not yet started in RS and ME. Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

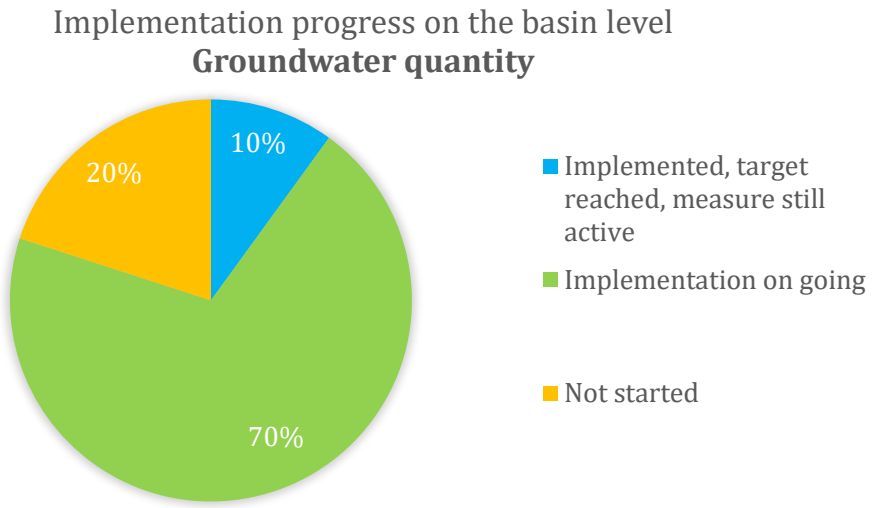


Figure 44: Implementation progress of measures for -groundwater quantity, Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 70% of the measures for groundwater quantity have status *Implementation ongoing*, while 10% of measures have status *Implemented, target reached maintenance of the results will continue, measure still active,* and 20 % Not started, as it is presented in Figure 44.

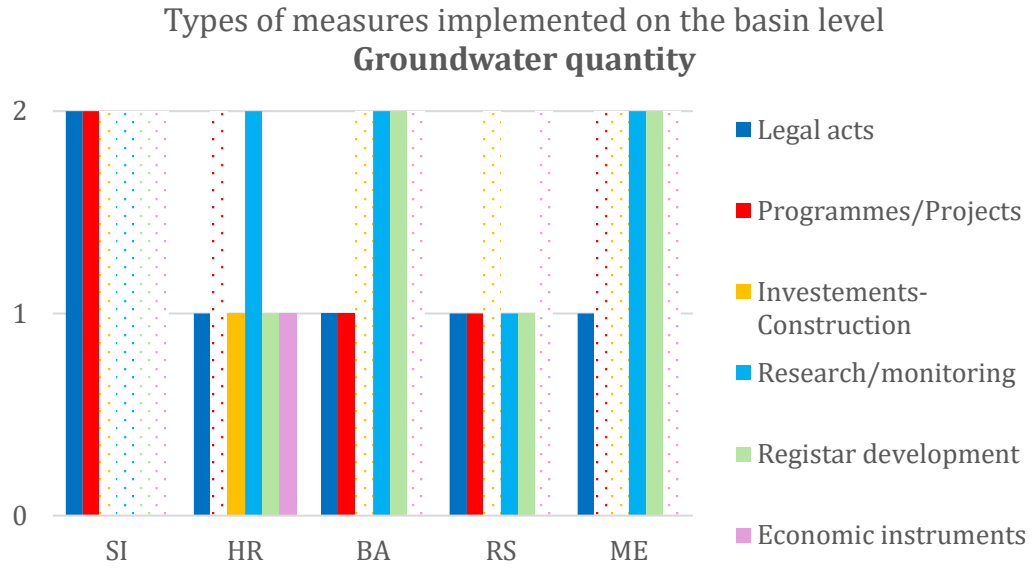


Figure 45: Types of measures implementation-Groundwater quantity (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 45, the types of measures implemented addressing the groundwater quantity in the Sava countries are presented. *Legal acts* are used as a type of measure for all measures in SI and for one measure in HR, BA, RS and ME. Through *Programmes/Projects* measures are carried out for all measures in SI, and for one measure in BA and RS. Type of measures *Investments-Construction* is used for one measure in HR. All measures in HR, BA, ME, and one measure in RS are implemented by *Research/Monitoring*. For one measure in HR, and

RS and for both measures in BA, and ME type of action implemented in *Registers development*. *Economic instruments* are used for one measure implementation in HR.

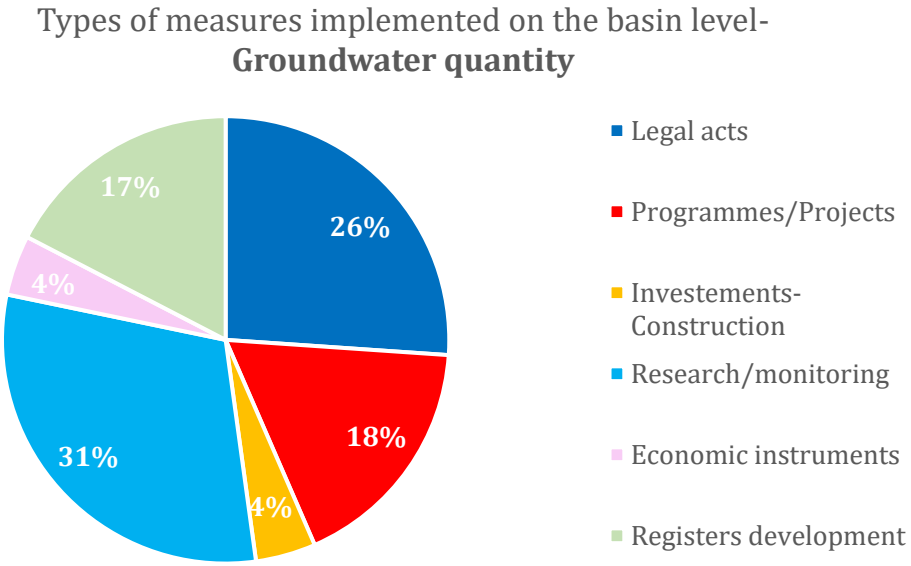


Figure 46: Types of measures implemented for groundwater quantity, on the Sava River Basin level

In Figure 46, the share of types of measures implemented to address groundwater quantity is presented for the Sava River Basin level.

Detailed information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

4.6 Measures for other (candidate) SWMIs

4.6.1 Invasive alien species

In the second Sava River Basin Management Plan, measure as steps towards the achievement of the management objectives for invasive alien species were formulated for all Sava countries as:

- Promoting research into methods and approaches that improve the ability to assess whether or not alien organisms will have an adverse impact on biodiversity including an investigation of the influence of invasive species on ecological status;
- Developing and implementing effective ways to identify and monitor alien organisms;
- Determining priorities for allocating resources for the control of harmful alien organisms based on their impact on native biodiversity and economic resources, and implementing effective controls or, where possible, eradication measures;
- Identifying and eliminating common sources of unintentional introductions;
- Developing national and international databases that support the identification and anticipation of the introduction of potentially harmful alien organisms in order to develop control and prevention measures;
- Ensuring that there is adequate legislation and enforcement to control introductions or escapes of harmful alien organisms, and improving preventative mechanisms such as screening standards and risk assessment procedures;
- Enhancing public education and awareness of the impacts of harmful alien organisms and the steps that can be taken to prevent their introduction

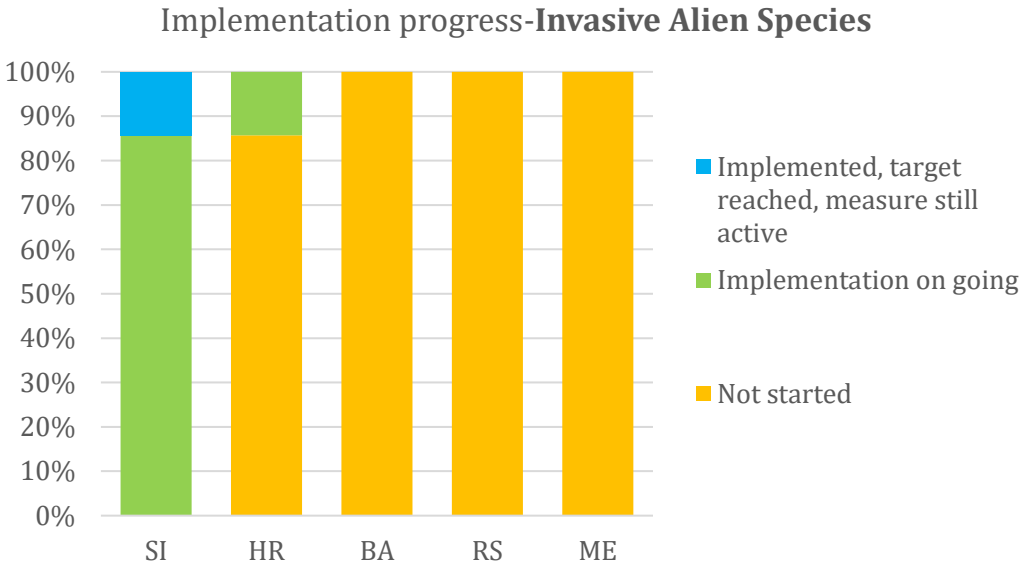


Figure 47: Implementation progress of measures for -Invasive alien species (country level)

Considering measures for Invasive Alien Species (set of seven (7) measures is commonly defined for the Sava countries) implementation progress is as shown in Figure 47. *Implementation ongoing* status is indicated for six (6) measures in SI, and one (1) measure in HR. One (1) measure in SI has status *Implemented, target reached maintenance of the results will continue, measure still active*. Implementation of five (5) measures in HR, and

all measures in BA. RS and ME for invasive alien species have status *Not started*. Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

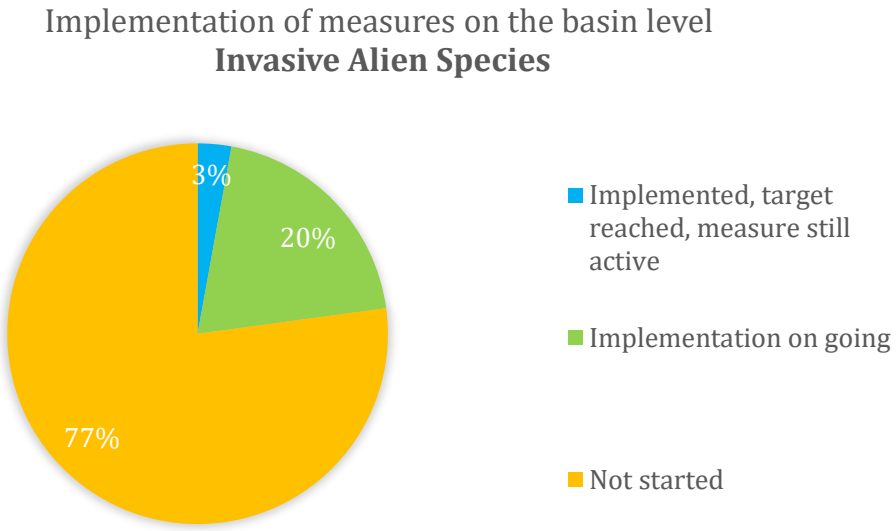


Figure 48: Implementation progress of measures for -Invasive alien species, Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 20% of the measures for invasive alien species have status *Implementation ongoing*, 3% of measures have status *Implemented, target reached maintenance of the results will continue, measure still active*, while 81% of measures have status *Not started*, as it is presented in Figure 48.

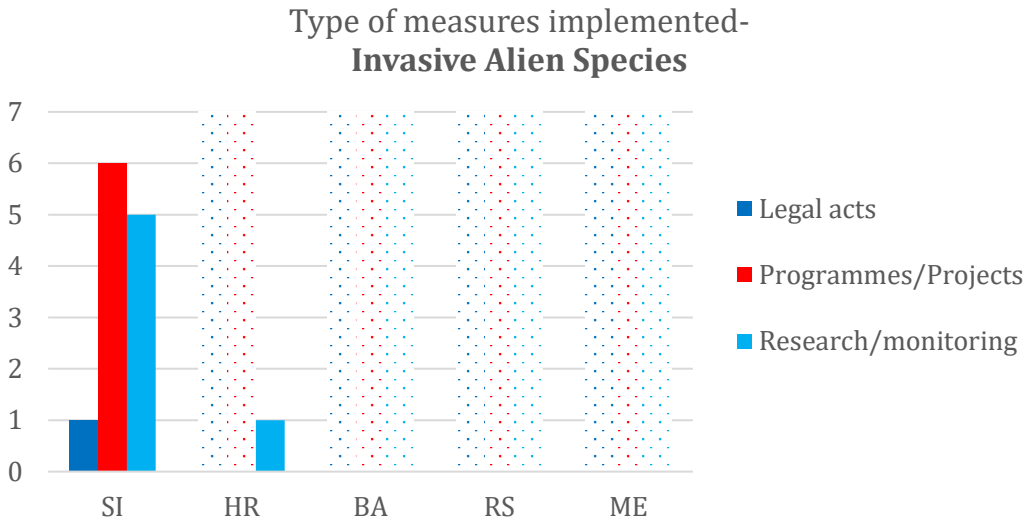


Figure 49: Types of measures implementation- Invasive alien species (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 49, the types of measures implemented addressing the invasive alien species in the Sava countries are presented. *Legal acts* are used as type of measures for one (1)

measure in SI. Through *Programmes/Projects*, six (6) measures are carried out in SI. Five (5) measures in SI and one (1) measure in HR are implemented by *Research/Monitoring*.

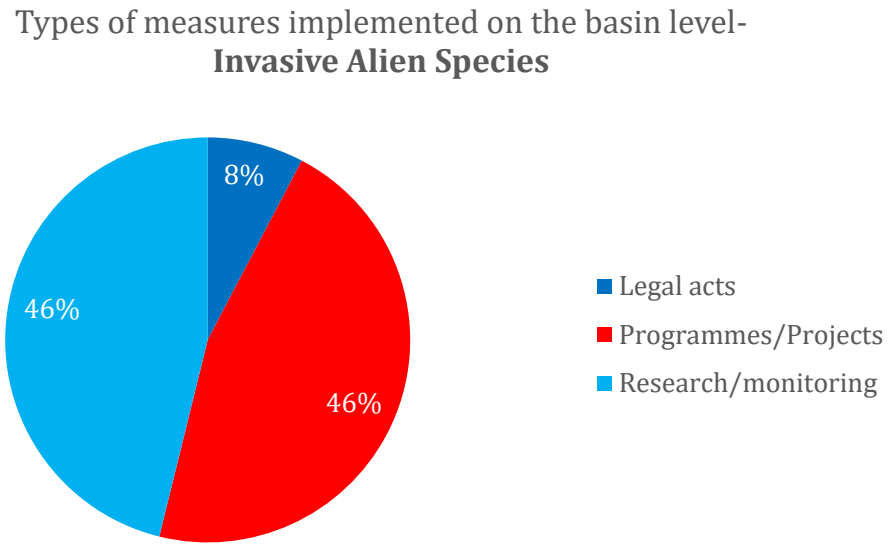


Figure 50: Types of measures implemented for invasive alien species, on the Sava River Basin level

In Figure 50, the share of types of measures implemented to address invasive alien species is presented for the Sava River Basin level.

Detailed information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

4.6.2 Sediment quality and quantity

In the 2nd Sava RBM Plan, measures as steps towards the achievement of the management objectives for sediment issues were formulated for all Sava countries as:

- Evaluation of sediment balance and sediment quality and quantity;
- Measures to control erosion processes;
- Measures to ensure the integrity of the water regime with regard to quality and quantity and to protect wetlands, floodplains, and retention areas;
- Monitoring of sediment;
- Measures to prevent impacts and the pollution of water or sediment;
- Measures to maintain conditions for safe navigation;
- Determination of designated areas for capital dredging;
- Guidance for sediment disposal, sediment treatment and use.

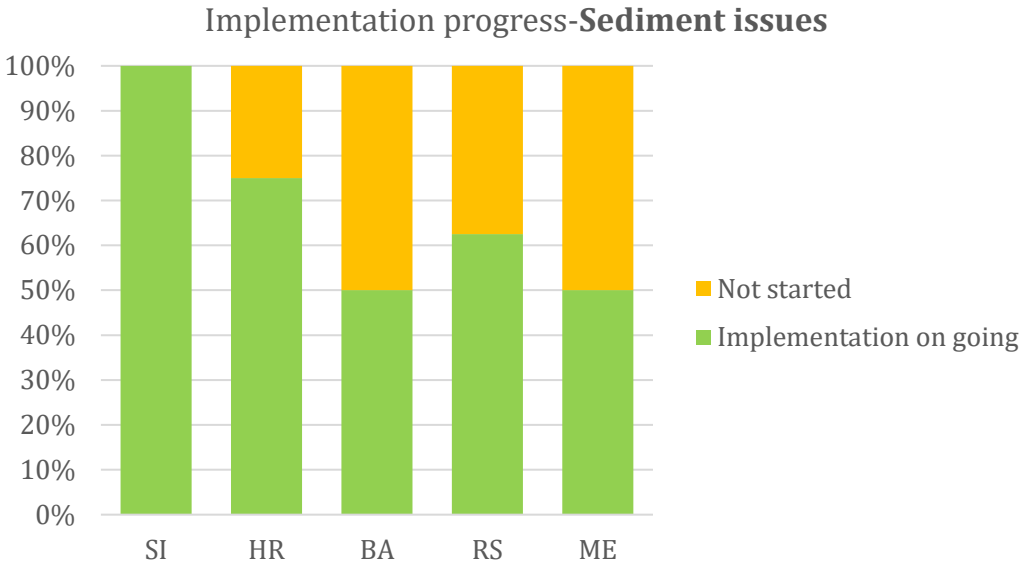


Figure 51: Implementation progress of measures for -Sediment issues (country level)

Considering measures for sediment quality and quantity issues (set of eight (8) measures is commonly defined for the Sava countries) implementation progress as shown in Figure 51. *Implementation ongoing* status is indicated for all eight (8) measures in SI, six (6) measures in HR, three (3) measures in BA (one (1) only in BA_RS), five (5) measures in RS and four (4) measures in ME. Implementation of other measures has not yet started (two(2) measures in HR, three (3) in BA, three (3) in RS, and four (4) in ME). Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

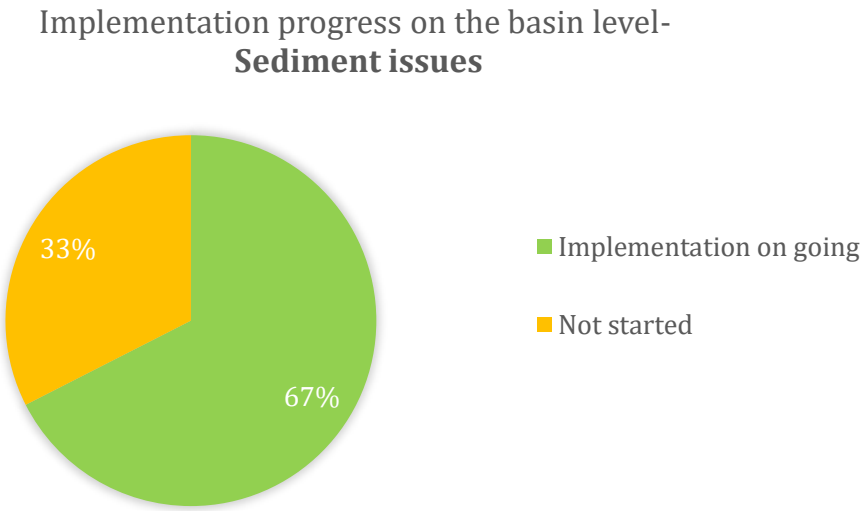


Figure 52: Implementation progress of measures for -Sediment issues, Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 67% of the measures for sediment issues have status *Implementation ongoing*, while 33% has status *Not started*, as is presented in Figure 52.

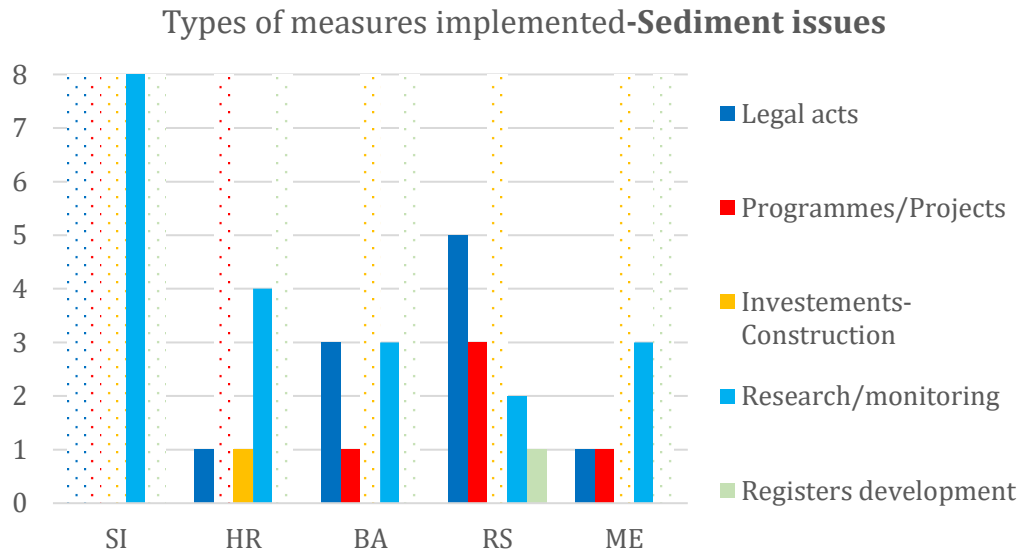


Figure 53: Types of measures implementation-Sediment issues (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 53, the types of measures implemented, addressing sediment issues in the Sava countries, are presented. *Legal acts* are used as type of measures for one measure in HR, three (3) measures in BA (one (1) only in BA_RS), five (5) measures in RS, and one (1) measure in ME. Through *Programmes/Projects* three (3) measures are carried out in RS, and one (1) in BA and in ME. All measures in SI, four (4) measures in HR, three (3) in BA and ME and, two (2) in RS are implemented by *Research/Monitoring*.

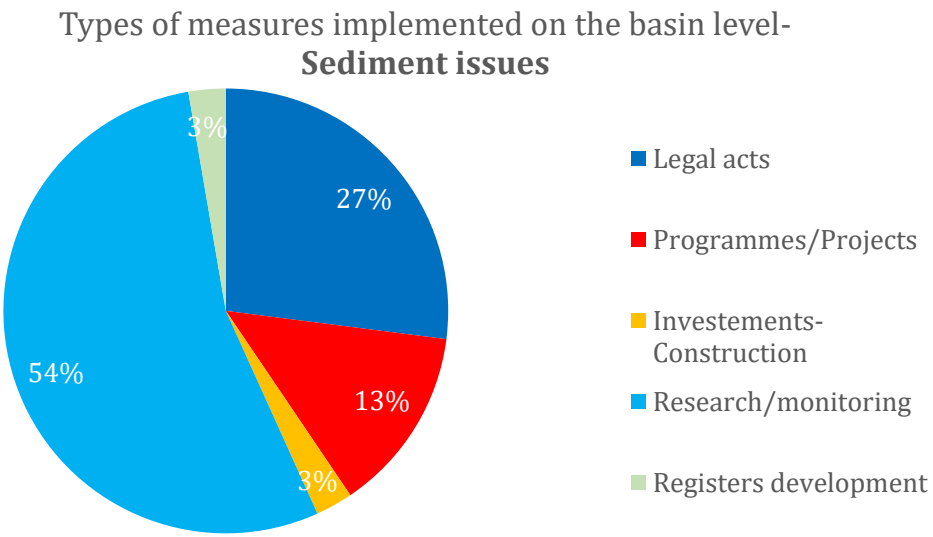


Figure 54: Types of measures implemented for sediment issues-the Sava River Basin level

In Figure 54, the share of types of measures implemented to address sediment issues is presented for the Sava River Basin level.

Detailed information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

4.7 Additional issue-Protected areas

In the second Sava River Basin Management Plan, measure as steps towards the achievement of the management objectives for protected areas were formulated for all Sava countries as:

- Step-by-step harmonization of national legislation with EU legislation (relevant for non-EU countries) with regard to the protection of habitats and/or species (Natura 2000, sites subject to the Birds Directive (2009/147/EC) and the Habitats Directive (92/43/EEC) and provision of effective instruments for the implementation of mentioned documents;
- Preparation of relevant legislation regarding the areas designated to protect economically significant aquatic species in accordance with the WFD;
- Identification and characterization of bathing waters (relevant for non-EU countries), harmonization of national legislation with Bathing Water Directives 2006/7/EC) (not relevant for Slovenia and Croatia);
- Further work on the implementation of the Nitrates Directive 91/676/EEC and the UWWT Directive 91/271/EEC;
- Finalization of the delineation of drinking water protection zones in the region and the preparation of standardized national registers of drinking water protection zones (for groundwater and surface water) including all the necessary data, above all the size of the protection area and the amount of abstraction (relevant for non-EU countries).

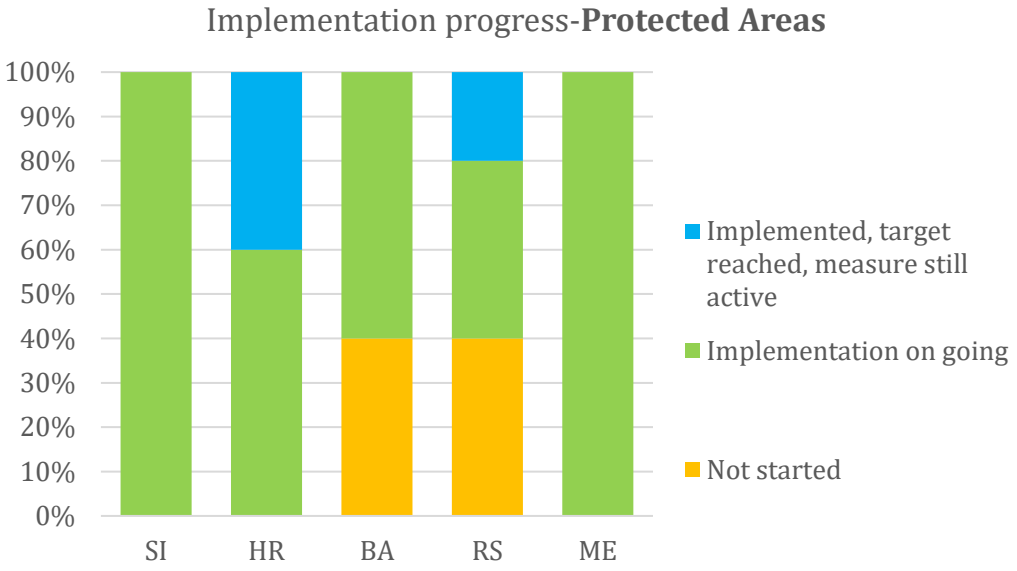


Figure 55: Implementation progress of measures for -Protected Areas (country level)

Considering measures for Protected Areas (one set of five (5) measures is commonly defined for the Sava countries) implementation progress as shown in Figure 55. *Implementation of ongoing* status is indicated for all measures in SI, and ME and for three (3) measures in HR, and BA, and two (2) in RS. Status of implementation for two (2) measures in HR, one (1) in RS defined as *Implemented, target reached-maintenance of the results will continue, measure still active*, while for two (2) measures in BA and in RS,

implementation have not yet started. Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

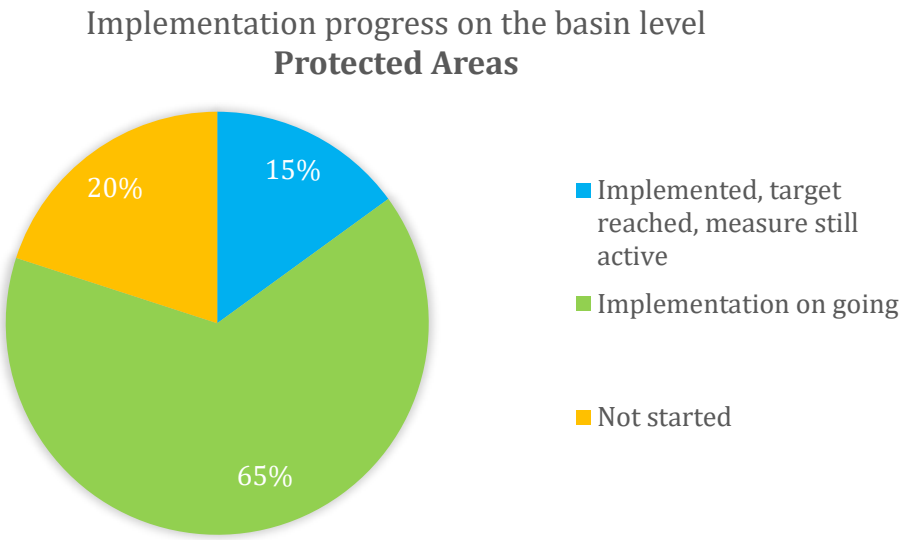


Figure 56: Implementation progress of measures for -Protected areas, Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 65% of the measures for protected have status *Implementation ongoing*, 15% of measures have status *Implemented, target reached maintenance of the results will continue, measure still active*, and 20% are in the status *Not started*, as it is presented in Figure 56.

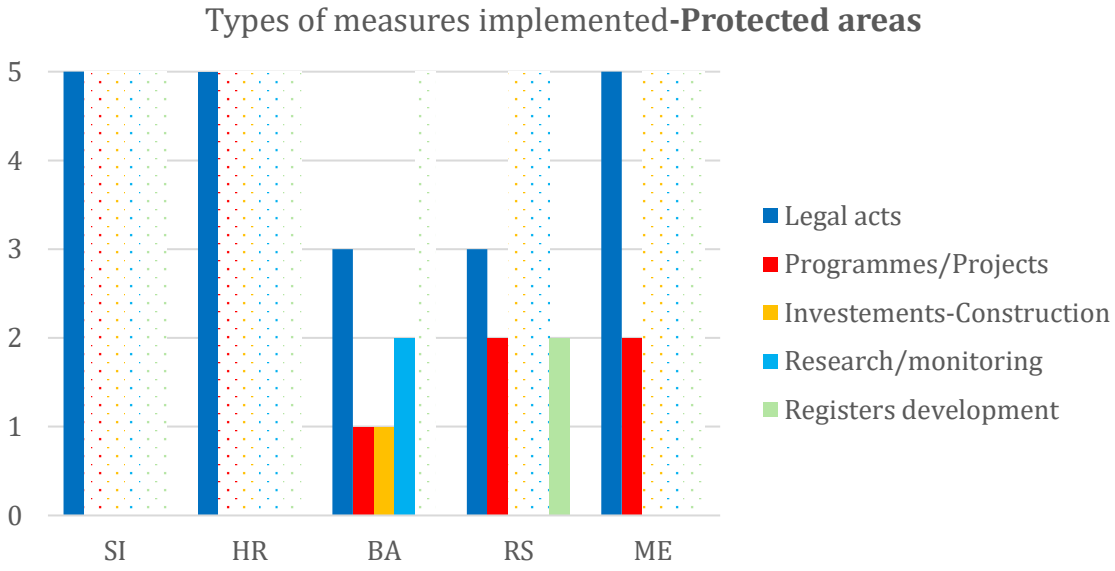


Figure 57 Types of measures implementation-Protected areas (pattern filled columns indicate type of measures that are not in implementation in the basin country)

In Figure 57, the types of measures implemented addressing Protected Areas in the Sava countries are presented. *Legal acts* are used as type of measures for all measures in SI, HR and ME, and as well for three (3) measures in BA and RS. Through *Programmes/Projects*

one measure is carried out in BA, and two (2) in RS and ME. Type of measures *Investments-Construction* is used for one measure in BA. *Research/Monitoring* is used for measure implementation for two measures in BA, while for two (2) measures in RS for measure implementation *Registers development* type of action is used.

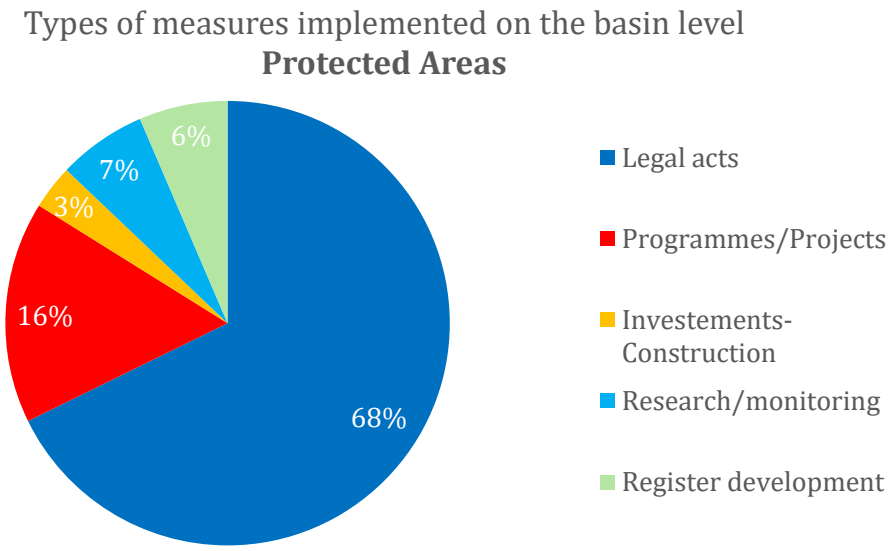


Figure 58: Types of measures implemented for protected areas, on the Sava River Basin level

In Figure 58, the share of types of measures implemented to address Protected Areas is presented for the Sava River Basin level.

Detailed information regarding types of measures implemented in the Sava riparian countries can be found in Annex III.

4.8 Other issue- Unregulated solid and mine waste disposal

In the 2nd Sava RBM Plan, other measures were formulated for all Sava countries, to address unregulated solid and mine waste disposal such as:

- Elaboration of a basin-wide inventory of potential accident risk spots;
- Estimation of the real risk at a particular site including assessment of an accidental pollution risk from the operational mines using checklists based on the related products of the ICPDR and the provisions of the Seveso-III- (Directive 2012/18/EU) and the UNECE Convention on the Transboundary Effects of Industrial Accidents;
- Elaboration of inventory of abandoned sites contaminated by waste disposal and by former industrial activities including abandoned tailing deposits with a special attention given to risk of flooding or leaking.

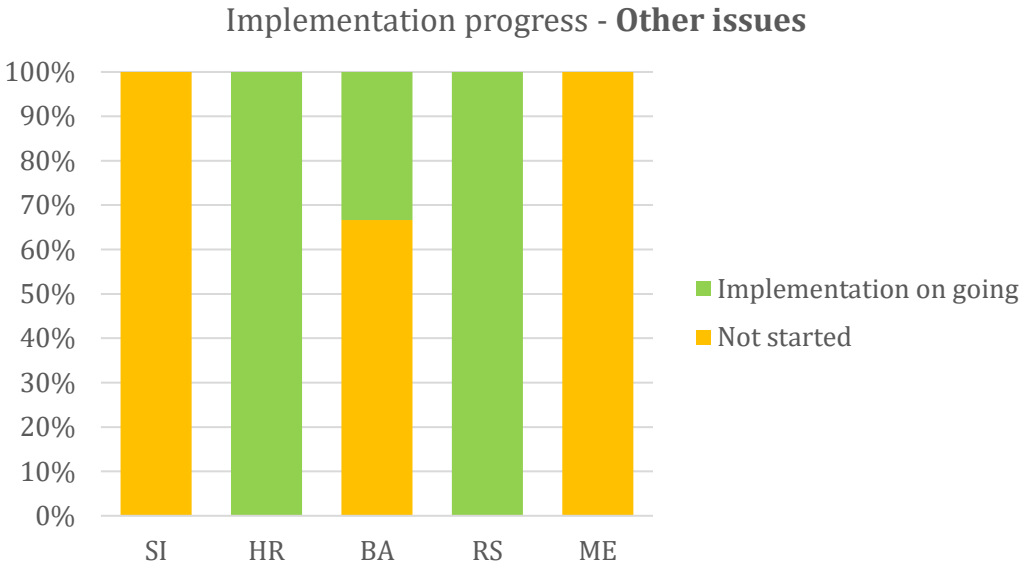


Figure 59: Implementation progress of measures for -Other issues (country level)

Considering other measures for unregulated solid and mining waste disposal (set of four (4) measures is commonly defined for the Sava countries) implementation progress as shown in Figure 59. *Implementation ongoing* status is indicated for all measures in HR, and RS and, one (1) measure in BA (only in BA_Fed). Implementation of two (2) measures in BA and all of the measures in SI and ME have status of implementation indicated as *Not started*. Detailed information regarding measures implementation status on the Sava countries' level can be found in Annex II.

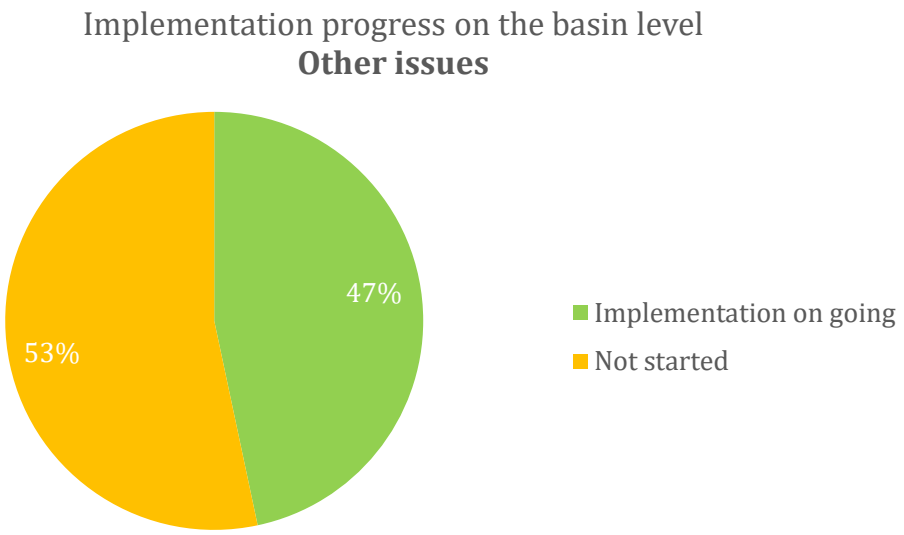


Figure 60: Implementation progress of measures for -Other issues, Sava River Basin level

Considering the basin wide aspect in total (all measures for all the Sava basin countries), 47% of the measures for other issues (unregulated solid and mining waste disposal) have status *Implementation ongoing*, while 53% Not started, as is presented in Figure 60. Measures are implemented by *Legal Acts*, *Research/Monitoring*, *Registers development* and *Programmes/Projects* in RS, and by *Investments-Construction* and *Research/Monitoring* in BA (only in BA_Fed).

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5 Progress on measures implementation on the Sava River Basin level

Tracking implementation of 2nd Sava RBM Plan Programme of Measures aims at recognizing advancement and challenges in measures implementation, as well as to inform all relevant stakeholders on progress achieved. The summary showing the progress in implementation of measures is presented in Figures 61 and 62.

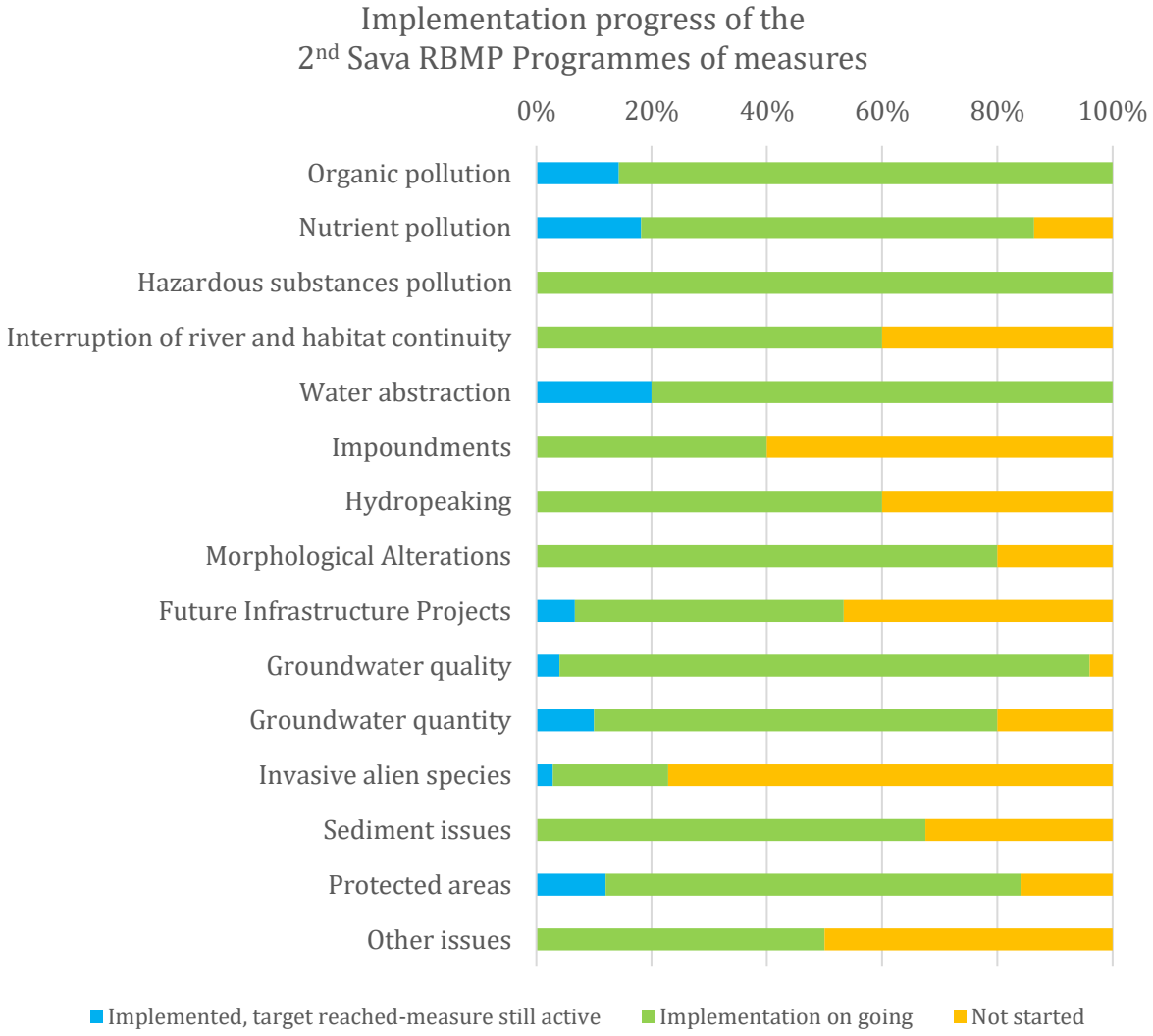

Figure 61: Progress in measures implementation for SWMIs, on the Sava River Basin level

As presented in Figure 61, for **organic pollution** reduction measures the analysis at the transboundary level shows that 86% of measures are ongoing and 14% have been implemented although the measures are still active.

Regarding the measures for **nutrient pollution** reduction, 18% of measures have been implemented but are still active and the result of their implementation should be maintained, 68% are ongoing, and 14% have not started yet.

In the field of **hazard pollution** reduction 100% of measures are ongoing.

Ongoing are 60% of the measures on **interruption of river and habitat continuity**, but the rest (40%) of the measures have not started yet.

Regarding the measures on **water abstraction,** the implementation of 80% of measures is ongoing, and the implementation of the 20% of measures have been implemented but are still active and the result of their implementation should be maintained.

Considering the **impoundment**, 40% of measures are ongoing and implementation of the rest (60%) of measures has not started yet.

Ongoing are 60% of the measures focused on **hydropeaking**, while implementation of other 40% of measures have not started yet.

Measures on **morphological alteration** are 80% in Implementation ongoing status, while 20% of measures are not started yet.

Regarding the measures on **future infrastructure projects**, 54% of proposed measures have not started yet, 47% are in ongoing status and 7% of measures in implemented and activity is currently related to maintenance of their implementation results.

Measures on **Groundwater** are focused on groundwater quality and groundwater quantity. Measures on **groundwater quality** are 92% in ongoing status, 3% of the measures have been implemented and activity is currently related to maintenance of their implementation results, while implementation of 4% of measures has not started yet. For 70% of measures addressing **groundwater quantity** implementation status is ongoing, while 20% has not yet started and 10% are implemented and activity is currently related to maintenance of their implementation results.

The Sava countries also provided information on measures implementation addressing other (candidate) SWMIs as follows:

- For **Invasive species** 20 % of measures are ongoing, 3% are implemented and activity is currently related to maintenance of their implementation results, while implementation of 77% of the measures have not started yet.
- On **sediment issues** 68% of measures is ongoing, while implementation of 33% of measures has not started yet.
- Most of the measures (72%) on **protected areas** are ongoing, 12% are implemented and activity is currently related to maintenance of their implementation results, while implementation of 16% of measures have not started yet.

The implementation of measures on **other issues** (unregulated solid and mine waste disposal) is ongoing in 50%, and in 50% implementation of measures has not yet started.

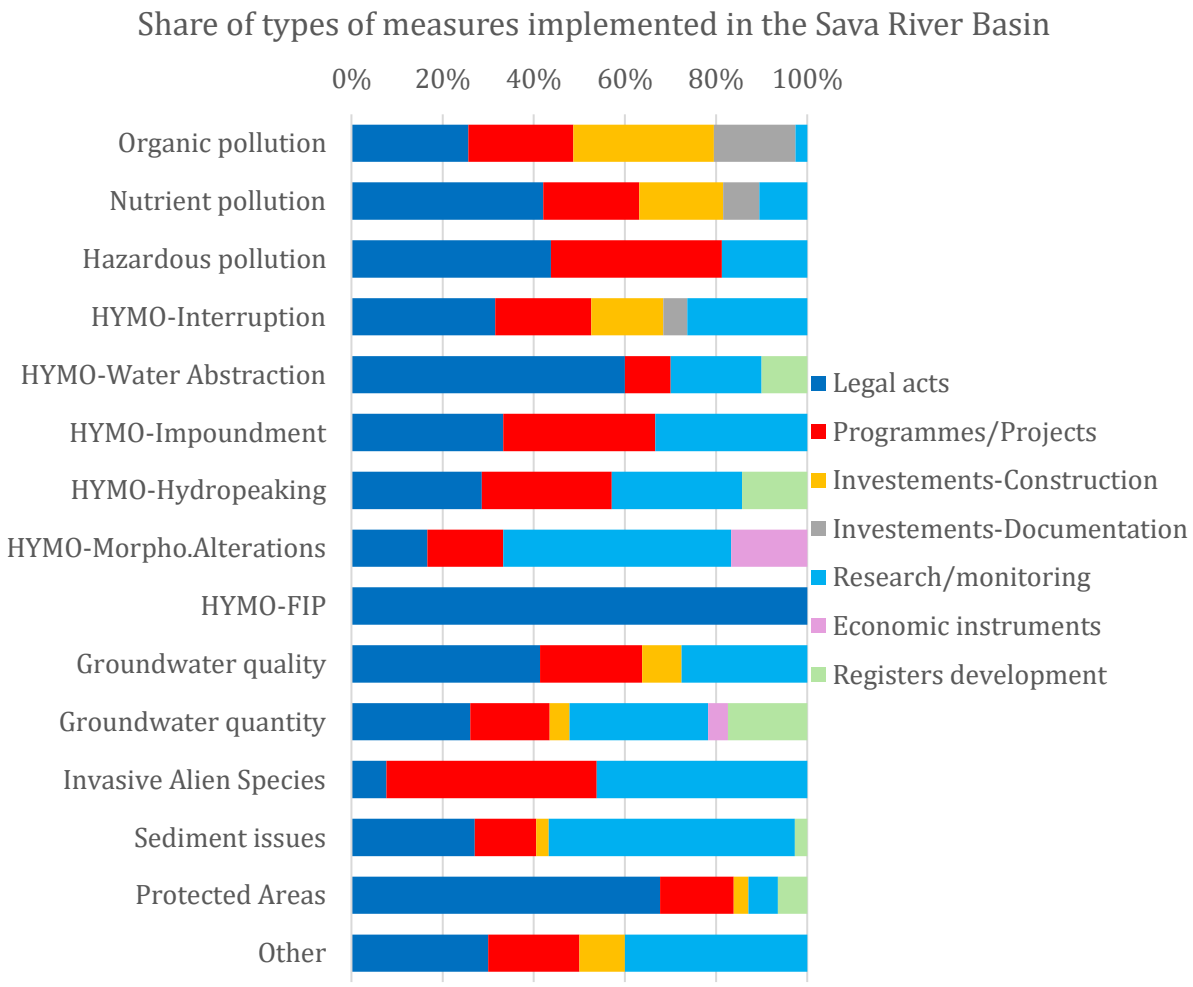

Figure 62: Types of measures implemented for SWMIs, on the Sava River Basin level

As indicated in Figure 62 the highest percentage of measures considering **organic pollution** reduction has been reached in *Investments-Construction* (31%), while 3% of measures were implemented as *Research/Monitoring*.

Regarding the measures for **nutrient pollution** reduction the highest percentage of 42% are *Legal acts*, while the lowest of 8% has been reached in *Investments-Documentation*.

In the field of **hazard pollution** reduction most of the measures comprise *Legal acts* (44%), while 19% measures are *Research/Monitoring*.

Legal acts comprise 32% of **interruption of river and habitat continuity** measures, while the lowest percentage (5%) is *Investments-Documentation*.

Regarding the measures for **water abstraction** most of the measures (60%) are *Legal acts* and 10% of measures are *Programmes/Projects* and *Registers development* (10%).

Considering the **impoundment** evident is the same representation of types of measures (33%) of *Legal acts*, *Programmes/Projects* and *Research/Monitoring*.

Considering the **hydropeaking** evident is the same representation of types of measures (29%) of *Legal acts*, *Programmes/Projects* and *Research/Monitoring*. In 14% the type of measure is *Registers development*.

The types of measure considering **morphological alteration** consists of 50% of research and monitoring, and equal representation (17%) of *Legal acts*, *Programmes/Projects* and *Economic instruments*.

Legal acts are the only type of measure implemented for **future infrastructure projects.**

For groundwater quality 41% of measures are *Legal acts*. Considering **groundwater quantity**, the highest percentage of measures comprise the *Research/Monitoring*, (30%) while the lowest percentage of 4% is related to *Economic instruments* and *Investments-Construction*.

The countries also reported on measures for other (candidate) SWMIs as follows:

- For **Invasive alien species** measures comprise *Programme/Projects* (46%), *Research/Monitoring* (46%), and *legal acts* (8%) only in SI and HR.
- Measures on **sediment issues** mainly (54%) are focused on *Research/Monitoring*.
- Most of the measures in **protected areas** comprise *Legal acts* (68%).

The measures on **other issues** are focused on *Legal acts*, *Programmes/Projects*, *Research/Monitoring* and *Registers development*.

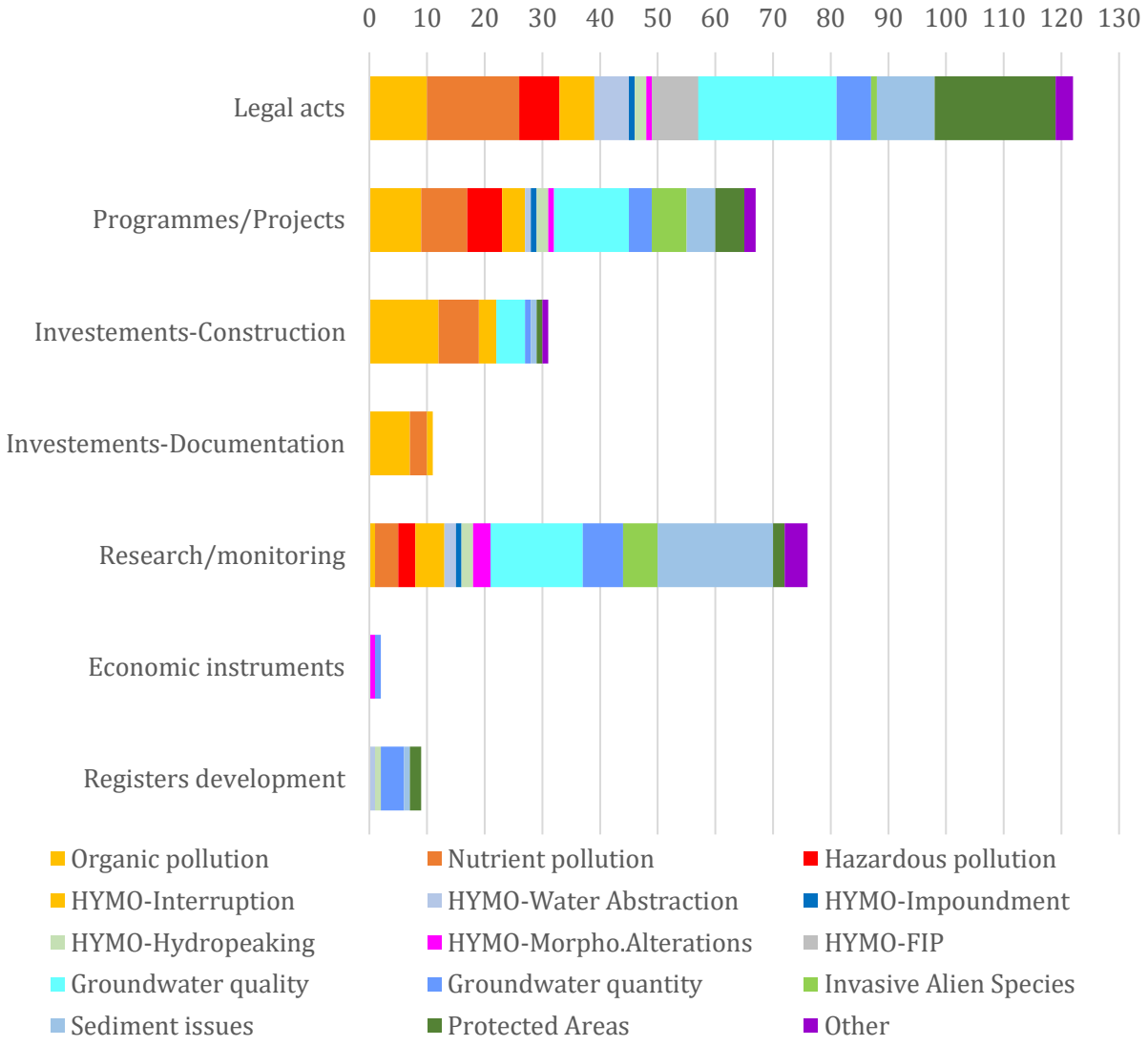

Figure 63: Measures implementated for specific SWMI (Sava River Basin level)

Figure 63 shows that types of measures implemented in the Sava River Basin. In total addressing all SWMIs and taking into consideration all measures implemented in all basin countries, 320 groups of measures are implemented. *Legal acts* address all water management issues, in total 122 cases identify as type of measures implemented. In total 76 measures with type of action research and monitoring, and 67 measures by *Programmes/Projects* have been implemented for all SWMIs except on HYMO-FIPs. *Investments-Construction* was identified in 31 measures implemented for organic and nutrient pollution, HYMO-Interruption of river and habitat continuity, groundwater issues, sediment, protected areas and for other measures. *Investments-Documentation* is applied as type of action in 11 measures for organic and nutrient pollution and HYMO Interruption of river and habitat continuity. *Registers development* comprises 11 measures covering HYMO-Water abstraction and HYMO-Hydropeaking, groundwater quantity and Sediment issues, Protected areas, and other measures (unregulated solid and mining waste disposal). *Economic instruments* are applied as type of measures for 2 measures in HYMO-Morphological alteration and for Groundwater quantity issue.

6 Future tasks, gaps identified and remaining challenges

As mentioned before, 2nd Sava RBM Programme of measures was developed in accordance with the requirements set in the WFD. Measures are formulated generally, which was fit for the purpose at the time when sets of measures were prepared (during the preparation of the Sava RBMP (2014) development). Since 2012, the conditions in the basin significantly changed, two Sava countries are now EU MS, while all others are candidates for the EU membership, making great advancements in measures implementation. Consequently, Programme of measures can be, in the following planning cycle, and in accordance with the Sava country needs, formulated as set of more specific actions toward Sava River Basin visions and management objectives in a more specific manner (besides measures that are important for the whole basin, measure formulation of a sub-catchment or even water bodies level can be taken into consideration).

Implementation of some sets of the measures shows to the great extent the status of implementation as "*Not started*". In this report, the bottle neck preventing the implementation of measures were not identified, whose analysis remains the task in the next planning cycle which will facilitate addressing of these issues.

For some of the measures, implementation is not in the direct responsibility of the water management sector. To some extent, progress of these measures' implementation is defined as not started, showing the need for a higher level of intersectoral cooperation on the countries and regional level.

Management objectives and corresponding measures should be reassessed, and formulated clearly and in some cases more accurately, considering advancement in measures' implementation in all Sava countries. Besides measures that originate from official Programmes of Measures (RBMPs) developed in the Sava countries, as other measures could be developed those that can serve as recommendations for actions on a basin level (studies, programmes, projects, if funding is available).

In the upcoming Sava River Basin management and planning cycles, Programme of measures should continue to be developed following collaborative and systematic approach, in alignment with the requirements of the WFD. Clear indicators for following the progress of measures implementation on a basin level should be uniformly defined.

The Programme of measures in the next planning cycles should involve estimation of the effect of suggested measures and the elaboration of the remaining "gaps" to meeting the objectives. Development of guidelines and prioritization of the measure's implementation can as well enhance the progress in measures implementation, which can be summarized and incorporated in the next Sava RBM plans.

7 Conclusions

The Interim Report on the 2nd Sava River Basin Management provides an overview of the implementation of the Programme of Measures after the adoption of the 2nd Sava River Basin Management Plan in December 2022.

The Sava riparian countries (Slovenia, Croatia, Bosnia and Hercegovina, Serbia and Montenegro) provided information on the status of measures implementation in the following categories:

i. Measures implemented, target reached-maintenance of the results will continue, measure still active,
ii. Implementation on-going and
iii. Not started.

Although it was available for the selection (as explained in Chapter Introduction), for none of the measure status is indicated as *Implementation of measure finalized-measure not active,* which confirms the relevance of the set of measures defined for each of the issues.

Information were also provided on types of measures implemented in each of the Sava countries, in the following categories:

i. Legal acts
ii. Programme/Projects
iii. Investments-Construction
iv. Investments-Documentation
v. Research/Monitoring
vi. Registers development and
vii. Economic instruments

Progress on measures implementation from the 2nd Sava RBMP can be assessed as satisfactory. For more than 70% of important issues the level of progress implementation is 50% or above. The highest level of implementation is shown for measures related to organic and nutrient pollution, water abstraction, groundwater quality and quantity and protected areas. The lowest level of progress is recognized in implementation of measures related to HYMO pressures, invasive alien species and sediment issues. Issues, like organic and nutrient pollution, water abstraction, future infrastructure projects, groundwater quality and quantity, invasive alien species, and protected areas, have measures whose implementation is finalized, and maintenance of the achieved results is ongoing.

Progress has been also demonstrated by the so-called light house projects implemented in the Sava riparian countries. The list of light house projects comprises examples in implementing nature-based solutions (NbS) for water management in SI (Mali Graben), Construction of WWTP with tertiary treatment in Bjelovar (HR), Improvement of municipal water infrastructure for the agglomeration Kutina (HR), development of the Master plan for agglomeration in BA to reduce pollution. Further, as light house are indicated the construction on small dams with fish passes for the flood protection in the Kolubara River Basin (RS), which takes into account a flow and habitat continuity, and the development of the methodology for the assessment of hydromorphological pressures in RS aiming on establishment of database for the next RBMP planning period. In ME the

project on implementation of the Nitrate Directive where the vulnerable zones have been identified and the Action Plan with measures addressing pollution caused by agricultural sources was developed.

Although significant progress in measures implementation can be recognized, it can be concluded that additional joint and coordinated efforts are needed for steps toward common objectives – to prevent further deterioration and enhance the status of surface and groundwater and aquatic and water dependent ecosystems, promote sustainable water use, enhance protection and improvement of the aquatic environment, facilitate intersectoral cooperation, contribute to the mitigation of the floods and droughts effects, and enhancing resilience to climate shocks, further contributing toward sustainable river basin management in the Sava River Basin.

ANNEXES

Annex I: SWMIs, visions and management objectives and measures addressing them

Table 2: The 2nd Sava RBM Plan Programme of Measures, addressing SWMIs

SWMI	VISION	MANAGEMENT OBJECTIVES	2nd Sava RBMP Programme of Measures	
Organic pollution	No emission of untreated wastewater into the waters of the Sava River Basin.	Phasing out all discharges of untreated wastewater from towns with >2.000 PE and from all major industrial and agricultural installations	Implementation of the Urban Waste Water Treatment Directive (91/271/EEC);	EU MS
			Implementation of the Sewage Sludge Directive (86/278/EEC);	
			Implementation of the Sewage Sludge Directive (86/278/EEC) and the Directive on industrial emissions - IPPC (2010/75/EC);	
			Increase of the efficiency and level of treatment when necessary	
			Specification of number of wastewater collecting systems (connected to respective WWTPs)	non EU MS
			Specification of number of municipal and industrial wastewater treatment plants which are planned to be constructed by 2027 including; - Specification of treatment level (secondary or tertiary treatment); - Specification of emission reduction targets	
Nutrient pollution	Reduction of nutrient emissions from point and diffuse sources in the Sava River Basin in order to avoid any negative impacts from eutrophication in the waters of the Sava River Basin.	Reduction of the nutrients loads entering the Sava River and its tributaries to levels consistent with the achievement of good ecological status/potential and good chemical status in the Sava River Basin	Implementation of the UWWTD (91/271/EEC);	EU MS
			Implementation of the EU Nitrates Directive (91/676/EEC)	
			Introduction of a maximum limit of 0.2 to 0.5% P weight/weight for the content of total phosphorus in laundry detergents for consumer use	non EU MS
			Working towards a market launch of polyphosphate-free dishwasher detergents for consumer use	
			Definition of basin-wide and/or national quantitative reduction targets (for point and diffuse sources) taking the respective preconditions and requirements of the Sava countries into account	
			Specification of number of wastewater collecting systems (connected to respective WWTPs), which are planned to be constructed by 2027	

SWMI	VISION	MANAGEMENT OBJECTIVES	2nd Sava RBMP Programme of Measures	
			Creation of baseline scenarios for nutrient input taking the respective preconditions and requirements of the Sava countries into account, up to 2027	
			Implementation of the Best Available Techniques and Best Environmental Practices regarding agricultural practices (for EU Member States linked to EU Common Agricultural Policy – CAP).	
Hazardous substance pollution	No risk or threat to human health or to the aquatic ecosystem of the waters of the Sava River Basin.	Elimination/reduction of the total amount of hazardous substances entering the Sava and its tributaries to levels consistent with good chemical status.	Implementation of the Directive on industrial emissions – IPPC (2010/75/EC) which also relates to the Dangerous Substances Directive 2006/11/EC and Directive 2008/105/EC on environmental quality standards for water policy	EU MS
			Implementation of Best Available Techniques and Best Environmental Practices including the further improvement of treatment efficiency, treatment level and/or substitution;	non EU MS
			Exploring the possibility to set down quantitative reduction objectives for pesticide emission in the Sava RB	
HYMO alterations	Balanced management of past, current and future structural changes of the riverine environment, so that the aquatic ecosystem of the Sava River Basin functions holistically and all native species are present	Anthropogenic barriers and habitat deficits do not hinder fish migration and spawning;	Specification of number and location, funding needs and funding sources for building of fish migration aids and other measures to achieve / improve river continuity which are intended to be implemented by 2021/2027 by the Sava countries (the 2015 deadline applies to Slovenia as an EU MS) ;	EU MS and non EU MS
			Specification of location, extent and measure type, funding needs and funding sources for restoration, conservation and improvements of habitats which are intended to be implemented by 2021/2027 by the Sava countries (the 2015 deadline applies to Slovenia as an EU MS).	
			Construction of fish migration aids and/or other measures to achieve / improve river continuity in the Sava River and its tributaries to safeguard reproduction and the self-sustaining of migratory species;	
			Restoration, conservation and improvements of habitats and their continuity for migratory species in the Sava River and its tributaries	
		Floodplains/wetlands in the Sava RB are protected, conserved, and restored ensuring the development of self-sustaining aquatic populations,	Restoration of natural river morphology where possible and, if it is not possible, implementation of the “no net-loss” principle	EU MS and non EU MS

SWMI	VISION	MANAGEMENT OBJECTIVES		2nd Sava RBMP Programme of Measures	
		flood protection and pollution reduction in the Sava RB			
		Law enforcement regarding riparian zone maintenance;			EU MS and non EU MS
		Control over sand and gravel extraction;			
		Avoiding reduction of floodplain size.			
		Additional investigations are needed to define the causes of morphological quality deterioration			
		Restoration of the meandering character of the river			
		Restoring and mitigating the effects of dredging			
		Planting of natural vegetation along the river courses			
		Improvement of hydrological alterations does not affect the aquatic ecosystem with regard to its natural development and distribution	Impounded water bodies are designated as heavily modified and therefore a good ecological potential need to be achieved.	Morphologically restructuring the headwater sections of impoundments	EU MS and non EU MS
			Discharge of a minimum ecological flow, ensuring that the biological quality elements have a good ecological status or good ecological potential	Ensuring sufficient residual flow below a water abstraction, meeting ecological flow requirements (i.e. for ensuring fish migration or for meeting good status in the section influenced by the water abstraction);	EU MS and non EU MS
			Water bodies affected by hydropeaking are designated as	Improvement of operational modifications	EU MS and non EU MS

SWMI	VISION	MANAGEMENT OBJECTIVES		2nd Sava RBMP Programme of Measures	
			heavily modified and a good ecological potential must be achieved.		
		Future infrastructure projects are conducted in the Sava RB in a transparent way using best environmental practices and best available techniques – impacts on, or the deterioration of, good status and negative trans-boundary effects are fully prevented, mitigated, or compensated.		Conduction of an Environmental Impact Assessment and/or a Strategic Environment Assessment in conjunction with the requirements of WFD Article 4(7) during the planning phase of future infrastructure projects if required;	EU MS and non EU MS
				Fulfilment of the conditions set out in WFD Article 4, in particular the provisions for new modifications specified in Article 4, Paragraph 7;	
				Recommendations for stakeholders regarding the implementation of best environmental practices and best available techniques.	
Groundwater quality	Emissions of polluting substances do not cause any deterioration of groundwater quality in the Sava River Basin, also taking into consideration the potential impact of climate change in the future. Where groundwater is already polluted, restoration to good quality will be the goal.	Prevention of pollution in order to avoid a deterioration of groundwater quality and to attain a good chemical status in GWBs		Implementation of the prevention / limitation of pollutants inputs into groundwater according to the EU Groundwater Directive (GWD, 2006/118/EC);	EU MS and non EU MS
		Elimination/reduction of the amount of hazardous substances and nitrates entering groundwater bodies in the Sava RB to prevent the deterioration of groundwater quality and to prevent any significant and sustained increase in the concentrations of pollutants in groundwater		Implementation of the Directive on industrial emissions IED (2010/75/EC) which also relates to the Directive 2008/105/EC on environmental quality standards and Directive (2013/39/EC) related to priority substances in the field of water policy	
				Implementation of the EU Nitrates Directive (91/676/EEC);	
		Reduction of pesticide/biocides emission into the Sava RB		Implementation of the Plant Protection Directive (91/414/EEC) and the Biocides Directive (98/8/EC);	
		Increase of wastewater treatment efficiency in order to avoid GW pollution from urban and industrial pollutions sources		Implementation of the Urban Wastewater Treatment Directive (91/271/EEC);	
		SUPLEMENTARY			

SWMI	VISION	MANAGEMENT OBJECTIVES	2nd Sava RBMP Programme of Measures	
		Implementation of the management objectives described for organic and nutrient pollution of surface water;		EU MS and non EU MS
		Increase of wastewater treatment efficiency;		
		Implementation of Best Available Techniques and Best Environmental Practices;		
		Reduction of pesticide / biocides emission in the Sava River Basin.		
Groundwater quantity	Water use is appropriately balanced and does not exceed the available groundwater resources in the Sava River Basin, taking into consideration the potential impacts of future climate change	Prevent over-abstraction from GWBs within the Sava RB by sound groundwater management	Over-abstraction from GWBs within the Sava River Basin will be avoided by sound groundwater management;	EU MS and non EU MS
			Implementation of WFD (2000/60/EC) requirements that groundwater resources are not depleted by the long-term annual average rate of abstraction	

Table 3: The 2nd Sava RBM Plan Programme of Measures, addressing SWMIs "candidates"

SWMI	VISION	MANAGEMENT OBJECTIVES	2nd Sava RBMP Programme of Measures	
Invasive alien species	Establish a coordinated basin-wide policy and management framework to minimize the risk of invasive alien species to the environment,	Consider the problem of invasive alien species as a long-term issue in order to prevent the introduction of harmful alien organisms and eliminate or reduce their adverse effects to acceptable levels.	Promoting research into methods and approaches that improve the ability to assess whether or not alien organisms will have an adverse impact on biodiversity including an investigation of the influence of invasive species on ecological status.	EU MS and non EU MS
			Developing and implementing effective ways to identify and monitor alien organisms;	
			Determining priorities for allocating resources for the control of harmful alien organisms based on their impact on native biodiversity and economic resources, and implementing effective controls or, where possible, eradication measures;	
			Identifying and eliminating common sources of unintentional introductions;	

SWMI	VISION	MANAGEMENT OBJECTIVES	2nd Sava RBMP Programme of Measures	
	economy and society. This will include a commitment to not knowingly introduce highrisk invasive alien species into the Sava River Basin.		Developing national and international databases that support the identification and anticipation of the introduction of potentially harmful alien organisms in order to develop control and prevention measures;	
			Ensuring that there is adequate legislation and enforcement to control introductions or escapes of harmful alien organisms, and improving preventative mechanisms such as screening standards and risk assessment procedures;	
			Enhancing public education and awareness of the impacts of harmful alien organisms and the steps that can be taken to prevent their introduction.	
Quantity and quality of sediments		• Based on an evaluation of sediment balance and sediment quality and quantity, to ensure the integrity of the water regime with regard to quality and quantity and to protect wetland, floodplains and retention areas; • Prevention of the impacts and pollution of water or sediment	Evaluation of sediment balance and sediment quality and quantity;	
			Measures to control erosion processes;	
			Measures to ensure the integrity of the water regime with regard to quality and quantity and to protect wetland, floodplains and retention areas;	
			Monitoring of sediment;	
			Measures to prevent impacts and the pollution of water or sediment;	
			Measures to maintain conditions for safe navigation;	
			Determination of designated areas for capital dredging;	
			Guidance for sediment disposal, sediment treatment and use	

Table 4: The 2nd Sava RBM Plan Programme of Measures, addressing Protected areas

ISSUE	2nd Sava RBMP Programme of Measures	
Protected Areas	Step-by-step harmonisation of national legislation with EU legislation (relevant for non-EU countries) with regard to the protection of habitats and/or species (Natura 2000, sites subject to the Birds Directive 79/409/EEC and the Habitats Directive 92/43/EEC) and provision of effective instruments for the implementation of mentioned documents;	EU MS and non EU MS
	Preparation of relevant legislation regarding the areas designated to protect economically significant aquatic species (Directive 78/659/EEC);	
	Identification and characterisation of bathing waters (relevant for non-EU countries), harmonisation of national legislation with Bathing Water Directives 76/160/EEC and 2006/7/EC) (not relevant for SI and HR);	

ISSUE	2nd Sava RBMP Programme of Measures	
	Further work on the implementation of the Nitrates Directive 91/676/EEC and the Urban Wastewater Treatment Directive 91/271/EEC within the region;	
	Finalisation of the delineation of drinking water protection zones in the region and the preparation of standardised national registers of drinking water protection zones (for groundwater and surface water) including all the necessary data, above all the size of the protection area and the amount of abstraction (relevant for non-EU countries);	

Table 5: The 2nd Sava RBM Plan Programme of Measures, addressing other issues

ISSUE	2nd Sava RBMP Programme of Measures	
Other	Unregulated solid & mining waste disposal	EU MS and non EU MS
	Elaboration of a basin-wide inventory of potential accident risk spots	
	Estimation of the real risk at a particular site including assessment of an accidental pollution risk from the operational mines using checklists based on the related products of the ICPDR and the provisions of the EU Seveso II Directive and the UN/ECE Convention on the Transboundary Effects of Industrial Accidents;	
	Elaboration of inventory of abandoned sites contaminated by waste disposal and by former industrial activities including abandoned tailing deposits with a special attention given to risk of flooding or leaking	

Annex II: The 2nd Sava RBMP Programme of measures- Implementation progress

Table 6: Implementation progress of measures for all water management issues (country level)

SWMI/issue	Measure	Applicable to	SI	HR	BA	RS	ME
Organic pollution	Implementation of the Urban Wastewater Treatment Directive (91/271/EEC);	EU MS					
	Implementation of the Sewage Sludge Directive (86/278/EEC) ;	EU MS					
	Implementation of the Directive on industrial emissions - IPPC (2010/75/EC);	EU MS					
	Increase of the efficiency and level of treatment when necessary	EU MS					
	Specification of number of wastewater collecting systems (connected to respective WWTPs)	non EU MS					
	Specification of number of municipal and industrial wastewater treatment plants which are planned to be constructed by 2027 including; - Specification of treatment level (secondary or tertiary treatment); - Specification of emission reduction targets	non EU MS					
Nutrient pollution	Implementation of the UWWTD (91/271/EEC);	EU MS					
	Implementation of the EU Nitrates Directive (91/676/EEC)	EU MS					
	Introduction of a maximum limit of 0.2 to 0.5% P weight/weight for the content of total phosphorus in laundry detergents for consumer use	non EU MS			Only BA_RS		
	Working towards a market launch of polyphosphate-free dishwasher detergents for consumer use	non EU MS			Only BA_RS		
	Definition of basin-wide and/or national quantitative reduction targets (for point and diffuse sources) taking the respective preconditions and requirements of the Sava countries into account	non EU MS					

SWMI/issue	Measure	Applicable to	SI	HR	BA	RS	ME
	Specification of number of wastewater collecting systems (connected to respective WWTPs), which are planned to be constructed by 2027	non EU MS					
	Creation of baseline scenarios for nutrient input taking the respective preconditions and requirements of the Sava countries into account, up to 2027	non EU MS					
	Implementation of the Best Available Techniques and Best Environmental Practices regarding agricultural practices (for EU Member States linked to EU Common Agricultural Policy – CAP).	non EU MS					
Hazardous substances pollution	Implementation of the Directive on industrial emissions – IPPC (2010/75/EC) which also relates to the Dangerous Substances Directive 2006/11/EC and Directive 2008/105/EC on environmental quality standards for water policy	EU MS					
	Implementation of the Best Available Techniques and Best Environmental Practices including the further improvement of treatment efficiency, treatment level and/or substitution;	non EU MS					
	Exploring the possibility to set down quantitative reduction objectives for pesticide emission in the Sava RB	non EU MS					
Interruption of river and habitat continuity	Specification of number and location, funding needs and funding sources for building of fish migration aids and other measures to achieve / improve river continuity which are intended to be implemented by 2021/2027 by the Sava countries (the 2015 deadline applies to Slovenia as an EU MS);	Common					
	Specification of location, extent and measure type, funding needs and funding sources for restoration, conservation and improvements of habitats which are intended to be implemented by 2021/2027 by the Sava countries (the 2015 deadline applies to Slovenia as an EU MS).	Common					
	Construction of fish migration aids and/or other measures to achieve / improve river continuity in the Sava River and its tributaries to safeguard reproduction and the self-sustaining of migratory species;	Common					
	Restoration, conservation and improvements of habitats and their continuity for migratory species in the Sava River and its tributaries	Common					
Water abstraction	Ensuring sufficient residual flow below a water abstraction, meeting ecological flow requirements (i.e. for ensuring fish migration or for meeting good status in the section influenced by the water abstraction);	Common					

SWMI/issue	Measure	Applicable to	SI	HR	BA	RS	ME
Impoundment	Morphologically restructuring the headwater sections of impoundments	Common					
Hydropeaking	Improvement of operational modifications	Common					
Morphological Alteration	Restoration of natural river morphology where possible and, if it is not possible, implementation of the "no net-loss" principle	Common			Only BA_Fed		
Future Infrastructure Projects	Conduction of an Environmental Impact Assessment and/or a Strategic Environment Assessment in conjunction with the requirements of WFD Article 4(7) during the planning phase of future infrastructure projects if required;	Common					
	Fulfilment of the conditions set out in WFD Article 4, in particular the provisions for new modifications specified in Article 4, Paragraph 7;	Common					
	Recommendations for stakeholders regarding the implementation of best environmental practices and best available techniques.	Common					
Groundwater quality	Implementation of the prevention / limitation of pollutants inputs into groundwater according to the EU Groundwater Directive (GWD, 2006/118/EC);	Common					
	Implementation of the EU Nitrates Directive (91/676/EEC);	Common					
	Implementation of the Plant Protection Directive (91/414/EEC) and the Biocides Directive (98/8/EC);	Common			Only BA_RS		
	Implementation of the Urban Wastewater Treatment Directive (91/271/EEC);	Common					
	Implementation of the Directive on industrial emissions IED (2010/75/EC) which also relates to the Directive 2008/105/EC on environmental quality standards and Directive (2013/39/EC) related to priority substances in the field of water policy	Common			Only BA_Fed		
Groundwater quantity	Over-abstraction from GWBs within the Sava River Basin will be avoided by sound groundwater management;	Common					

SWMI/issue	Measure	Applicable to	SI	HR	BA	RS	ME
	Implementation of WFD (2000/60/EC) requirements that groundwater resources are not depleted by the long-term annual average rate of abstraction	Common					
Invasive alien species	Promoting research into methods and approaches that improve the ability to assess whether or not alien organisms will have an adverse impact on biodiversity including an investigation of the influence of invasive species on ecological status.	Common					
	Developing and implementing effective ways to identify and monitor alien organisms;	Common					
	Determining priorities for allocating resources for the control of harmful alien organisms based on their impact on native biodiversity and economic resources, and implementing effective controls or, where possible, eradication measures;	Common					
	Identifying and eliminating common sources of unintentional introductions;	Common					
	Developing national and international databases that support the identification and anticipation of the introduction of potentially harmful alien organisms in order to develop control and prevention measures;	Common					
	Ensuring that there is adequate legislation and enforcement to control introductions or escapes of harmful alien organisms, and improving preventative mechanisms such as screening standards and risk assessment procedures;	Common					
	Enhancing public education and awareness of the impacts of harmful alien organisms and the steps that can be taken to prevent their introduction.	Common					
Sediment issues	Evaluation of sediment balance and sediment quality and quantity;	Common					
	Measures to control erosion processes;	Common					
	Measures to ensure the integrity of the water regime with regard to quality and quantity and to protect wetland, floodplains and retention areas;	Common					
	Monitoring of sediment;	Common					

SWMI/issue	Measure	Applicable to	SI	HR	BA	RS	ME
	Measures to prevent impacts and the pollution of water or sediment;	Common					
	Measures to maintain conditions for safe navigation;	Common					
	Determination of designated areas for capital dredging;	Common					
	Guidance for sediment disposal, sediment treatment and use	Common			Only BA_RS		
Protected areas	Step-by-step harmonization of national legislation with EU legislation (relevant for non-EU countries) with regard to the protection of habitats and/or species (Natura 2000, sites subject to the Birds Directive 79/409/EEC and the Habitats Directive 92/43/EEC) and provision of effective instruments for the implementation of mentioned documents;	Common					
	Preparation of relevant legislation regarding the areas designated to protect economically significant aquatic species (Directive 78/659/EEC);	Common					
	Identification and characterisation of bathing waters (relevant for non-EU countries), harmonisation of national legislation with Bathing Water Directives 76/160/EEC and 2006/7/EC) (not relevant for SI and HR);	Common					
	Further work on the implementation of the Nitrates Directive 91/676/EEC and the Urban Wastewater Treatment Directive 91/271/EEC within the region;	Common					
	Finalisation of the delineation of drinking water protection zones in the region and the preparation of standardised national registers of drinking water protection zones (for groundwater and surface water) including all the necessary data, above all the size of the protection area and the amount of abstraction (relevant for non-EU countries);	Common					
Other/ Unregulated solid and mining waste disposal	Elaboration of a basin-wide inventory of potential accident risk spots	Common					
	Estimation of the real risk at a particular site including assessment of an accidental pollution risk from the operational mines using checklists based on the related products of the ICPDR and the provisions of the EU Seveso II Directive and the UN/ECE Convention on the Transboundary Effects of Industrial Accidents;	Common					

SWMI/issue	Measure	Applicable to	SI	HR	BA	RS	ME
	Elaboration of inventory of abandoned sites contaminated by waste disposal and by former industrial activities including abandoned tailing deposits with special attention given to risk of flooding or leaking	Common			Only BA_Fed		

Legend (colors indications):

PROGRESS IN MEASURES IMPLEMENTATION	
	Implemented, target reached, maintenance of the results will continue, measure still active
	Implementation on going
	Not started
	Measure is not applicable for the country

Annex III Types of measures implemented

Table 7: Types od measures implemented (the Sava country level)

MEASURE	SI	HR	BA	RS	ME
ORGANIC POLLUTION					
Implementation of the Urban Waste Water Treatment Directive (91/271/EEC); Increase of the efficiency and level of treatment when necessary	Legal acts	Legal acts			
	Programmes/ Projects	Programmes/ Projects			
	Investments-Construction	Investments-Construction			
Implementation of the Sewage Sludge Directive (86/278/EEC);	Legal acts	Legal acts			
	Programmes/ Projects	Investments-Construction			
	Investments-Construction				
Implementation of the Directive on Industrial Emissions - IPPC (2010/75/EC);	Legal acts	Legal acts			
	Programmes/ Projects	Investments-Construction			
	Investments-Construction				
Increase of the efficiency and level of treatment when necessary	Legal acts	Legal acts			
	Programmes/ Projects	Investments-Construction			
	Investments-Documentation				
Specification of number of wastewater collecting systems (connected to respective WWTPs)			Programmes/ Projects	Legal acts	Programmes/ Projects
			Investments-Construction	Investments-Documentation	Investments-Documentation
			Investments-Documentation	Investments-Construction	Investments-Construction
Specification of number of municipal and industrial wastewater treatment plants which are planned to be constructed by 2027 including;			Investments-Construction	Legal acts	Programmes/ Projects
			Research/ monitoring	Investments-Documentation	Investments-Documentation

MEASURE	SI	HR	BA	RS	ME
- Specification of treatment level (secondary or tertiary treatment); - Specification of emission reduction targets			Investments-Documentation	Investments-Construction	Investments-Construction
NUTRIENT POLLUTION					
Implementation of the UWWTD (91/271/EEC);	Legal acts	Legal acts			
	Programmes/ Projects	Programmes/ Projects			
	Investments-Construction	Investments-Construction			
Implementation of the EU Nitrates Directive (91/676/EEC)	Legal acts	Legal acts			
	Programmes/ Projects	Research/ Monitoring			
	Investments-Construction	Programmes/ Projects			
		Investments-Construction			
Introduction of a maximum limit of 0.2 to 0.5% P weight/weight for the content of total phosphorus in laundry detergents for consumer use			Legal acts	Legal acts (BA_RS)	Legal acts
Working towards a market launch of polyphosphate-free dishwasher detergents for consumer use			Legal acts	Legal acts (BA_RS)	Legal acts
Definition of basin-wide and/or national quantitative reduction targets (for point and diffuse sources) taking the respective preconditions and requirements of the Sava countries into account				Legal acts	Legal acts
Specification of number of wastewater collecting systems (connected to respective WWTPs), which are planned to be constructed by 2027			Programmes/ Projects	Investments-Documentation	Programmes/ Projects
			Investments-Construction	Investments-Construction	Investments-Construction
			Investments-Documentation	Legal acts	Investments-Documentation
Creation of baseline scenarios for nutrient input taking the respective preconditions and requirements of the Sava countries into account, up to 2027			Research/ Monitoring		
Implementation of the Best Available Techniques and Best Environmental Practices regarding agricultural practices (for EU Member States linked to EU Common Agricultural Policy – CAP)			Legal acts	Legal acts	Legal acts
			Research/Monitoring	Programmes/ Projects	Programmes/ Projects

MEASURE	SI	HR	BA	RS	ME
				Research/ Monitoring	
HAZARDOUS SUBSTANCES POLLUTION					
Implementation of the Directive on industrial emissions – IPPC (2010/75/EC) which also relates to the Dangerous Substances Directive 2006/11/EC and Directive 2008/105/EC on environmental quality standards for water policy	Legal acts	Legal acts			
	Programmes/ Projects	Programmes/ Projects			
		Research/ Monitoring			
Implementation of Best Available Techniques and Best Environmental Practices including the further improvement of treatment efficiency, treatment level and/or substitution			Legal acts	Legal acts	Legal acts
			Programmes/ Projects	Programmes/ Projects	Research/ Monitoring
			Research/ Monitoring		Programmes/ Projects
Exploring the possibility to set down quantitative reduction objectives for pesticide emission in the Sava RB				Legal acts	Legal acts
				Programmes/ Projects	
HYMO Alterations-Interruption of river and habitat continuity					
Specification of number and location, funding needs and funding sources for building of fish migration aids and other measures to achieve / improve river continuity which are intended to be implemented by 2021/2027 by the Sava countries (the 2015 deadline applies to Slovenia as an EU MS);	Legal acts	Investments-Construction			Research/ Monitoring
	Programmes/ Projects				
Specification of location, extent and measure type, funding needs and funding sources for restoration, conservation and improvements of habitats which are intended to be implemented by 2021/2027 by the Sava countries (the 2015 deadline applies to Slovenia as an EU MS)	Legal acts	Research/ Monitoring			
	Programmes/ Projects				
Construction of fish migration aids and/or other measures to achieve / improve river continuity in the Sava River and its tributaries to safeguard reproduction and the self-sustaining of migratory species;	Legal acts	Research/ Monitoring		Legal acts	
	Programmes/ Projects			Investments-Construction	
				Investments-Documentation	

MEASURE	SI	HR	BA	RS	ME
HYMO Alterations-Water Abstraction					
Ensuring sufficient residual flow below a water abstraction, meeting ecological flow requirements (i.e. for ensuring fish migration or for meeting good status in the section influenced by the water abstraction)	Legal acts	Research/ Monitoring	Legal acts	Legal acts	Legal acts
	Programmes/ Projects	Legal acts	Legal acts		
		Registers development	Research/Monitoring		
HYMO Alterations-Impoundment					
Morphologically restructuring the headwater sections of impoundments	Legal acts	Research/ Monitoring			
	Programmes/ Projects				
HYMO Alterations-Hydropeaking					
Improvement of operational modifications	Legal acts	Research/ Monitoring		Legal acts	
	Programmes/ Projects			Research/ Monitoring	
				Programmes/ Projects	
				Registers development	
HYMO Alterations-Morphological Alterations					
Restoration of natural river morphology where possible and, if it is not possible, implementation of the "no net-loss" principle	Legal acts	Research/ Monitoring	Research/ Monitoring (BA_Fed)		Research/ Monitoring
	Programmes/ Projects				Economic instruments
HYMO Alterations-Future Infrastructure Project					
Conduction of an Environmental Impact Assessment and/or a Strategic Environment Assessment in conjunction with the requirements of WFD Article 4(7) during the planning phase of future infrastructure projects if required;	Legal acts	Legal acts			Legal acts
Fulfilment of the conditions set out in WFD Article 4, in particular the provisions for new modifications specified in Article 4, Paragraph 7;	Legal acts	Legal acts			

MEASURE	SI	HR	BA	RS	ME
Recommendations for stakeholders regarding the implementation of best environmental practices and best available techniques.	Legal acts	Legal acts		Legal acts	
GROUNDWATER QUALITY					
Implementation of the prevention / limitation of pollutants inputs into groundwater according to the EU Groundwater Directive (GWD, 2006/118/EC)	Legal acts	Legal acts	Legal acts	Legal acts	Research/ Monitoring
	Research/ Monitoring	Research/ Monitoring			Legal acts
	Programmes/ Projects	Programmes/ Projects	Research/Monitoring	Programmes/ Projects	
	Investments-Construction				
Implementation of the EU Nitrates Directive (91/676/EEC);	Legal acts	Legal acts	Legal acts	Legal acts	Legal acts
	Research/ Monitoring	Research/ Monitoring	Research/ Monitoring		Research/ Monitoring
	Programmes/ Projects	Programmes/ Projects	Programmes/ Projects		
	Investments-Construction				
Implementation of the Plant Protection Directive (91/414/EEC) and the Biocides Directive (98/8/EC);	Legal acts	Legal acts	Legal acts	Legal acts (BA_RS)	
	Research/ Monitoring	Research/ Monitoring			
	Programmes/ Projects	Programmes/ Projects			
	Investments-Construction				
Implementation of the Urban Wastewater Treatment Directive (91/271/EEC);	Legal acts	Legal acts	Legal acts	Legal acts	Legal acts
	Research/ Monitoring	Research/ Monitoring	Research/ Monitoring		Programmes/ Projects
	Programmes/ Projects	Programmes/ Projects			
	Investments-Construction				
Implementation of the Directive on industrial emissions IED (2010/75/EC) which also relates to the Directive 2008/105/EC	Legal acts	Legal acts	Legal acts	Legal acts (BA_Fed)	Legal acts
	Research/ Monitoring	Research/ Monitoring			Research/ Monitoring

MEASURE	SI	HR	BA	RS	ME
on environmental quality standards and Directive (2013/39/EC) related to priority substances in the field of water policy	Programmes/ Projects	Programmes/ Projects			
	Investments-Construction				
GROUNDWATER QUANTITY					
Over-abstraction from GWBs within the Sava River Basin will be avoided by sound groundwater management;	Legal acts	Legal acts	Legal acts	Legal acts	Legal acts
	Programmes/ Projects	Research/ Monitoring	Research/ Monitoring	Research/ Monitoring	Research/ Monitoring
		Investments-Construction	Registers development	Programmes/ Projects	
			Programmes/ Projects	Registers development	
Implementation of WFD (2000/60/EC) requirements that groundwater resources are not depleted by the long-term annual average rate of abstraction	Legal acts	Research/ Monitoring	Research/ Monitoring		Research/ Monitoring
	Programmes/ Projects	Registers development	Registers development		
		Economic instruments			
INVASIVE ALIEN SPECIES					
Promoting research into methods and approaches that improve the ability to assess whether or not alien organisms will have an adverse impact on biodiversity including an investigation of the influence of invasive species on ecological status.	Research/ Monitoring				
Developing and implementing effective ways to identify and monitor alien organisms;	Research/ Monitoring				
	Programmes/ Projects				
Determining priorities for allocating resources for the control of harmful alien organisms based on their impact on native biodiversity and economic resources, and implementing effective controls or, where possible, eradication measures;	Research/ Monitoring				
	Programmes/ Projects				
Identifying and eliminating common sources of unintentional introductions;	Legal acts				
	Research/ Monitoring				
	Programmes/ Projects				

MEASURE	SI	HR	BA	RS	ME
Developing national and international databases that support the identification and anticipation of the introduction of potentially harmful alien organisms in order to develop control and prevention measures;	Programmes/ Projects				
Ensuring that there is adequate legislation and enforcement to control introductions or escapes of harmful alien organisms, and improving preventative mechanisms such as screening standards and risk assessment procedures;	Programmes/ Projects				
Enhancing public education and awareness of the impacts of harmful alien organisms and the steps that can be taken to prevent their introduction.	Research/ Monitoring	Research/ Monitoring			
	Programmes/ Projects				
SEDIMENT ISSUES					
Evaluation of sediment balance and sediment quality and quantity;			Legal acts		
	Research/ Monitoring	Research/ Monitoring	Research/ Monitoring		
Measures to control erosion processes;	Research/ Monitoring	Research/ Monitoring	Legal acts	Legal acts	Research/ Monitoring
			Research/ Monitoring	Programmes/ Projects	
				Registers development	
Measures to ensure the integrity of the water regime with regard to quality and quantity and to protect wetland, floodplains and retention areas;	Research/ Monitoring	Research/ monitoring			Research/ Monitoring
					Programmes/ Projects
Monitoring of sediment;	Research/ Monitoring	Research/ Monitoring	Research/ Monitoring	Legal acts	Research/ Monitoring
			Programmes/ Projects	Research/ Monitoring	
				Programmes/ Projects	
Measures to prevent impacts and the pollution of water or sediment;	Research/ Monitoring	Legal acts		Legal acts	
				Research/ Monitoring	

MEASURE	SI	HR	BA	RS	ME
Measures to maintain conditions for safe navigation;	Research/ Monitoring	Investments-Construction		Legal acts	
				Programmes/ Projects	
Determination of designated areas for capital dredging;	Research/ Monitoring				
Guidance for sediment disposal, sediment treatment and use	Research/ Monitoring		Legal acts	Legal acts (BA_RS)	Legal acts
PROTECTED AREAS					
Step-by-step harmonisation of national legislation with EU legislation (relevant for non-EU countries) with regard to the protection of habitats and/or species (Natura 2000, sites subject to the Birds Directive 79/409/EEC and the Habitats Directive 92/43/EEC) and provision of effective instruments for the implementation of mentioned documents;	Legal acts	Legal acts		Legal acts	Legal acts
				Registers development	
				Programmes/ Projects	
Preparation of relevant legislation regarding the areas designated to protect economically significant aquatic species (Directive 78/659/EEC);	Legal acts	Legal acts			Legal acts
Identification and characterisation of bathing waters (relevant for non-EU countries), harmonisation of national legislation with Bathing Water Directives 76/160/EEC and 2006/7/EC) (not relevant for SI and HR);	Legal acts	Legal acts	Legal acts		Legal acts
					Programmes/ Projects
Further work on the implementation of the Nitrates Directive 91/676/EEC and the Urban Wastewater Treatment Directive 91/271/EEC within the region;	Legal acts	Legal acts	Legal acts	Legal acts	Legal acts
			Research/ Monitoring	Registers development	
				Programmes/ Projects	
Finalisation of the delineation of drinking water protection zones in the region and the preparation of standardised national registers of drinking water protection zones (for groundwater and surface water) including all the necessary data, above all the size of the protection area and the amount of abstraction (relevant for non-EU countries);	Legal acts	Legal acts	Legal acts	Legal acts	Legal acts
			Investments-Construction		Programmes/ Projects
			Research/ Monitoring		
			Programmes/ Projects		

MEASURE	SI	HR	BA	RS	ME
OTHER ISSUES- Unregulated solid and mining waste disposal					
Elaboration of a basin-wide inventory of potential accident risk spots				Legal acts	
				Research/ Monitoring	
Estimation of the real risk at a particular site including assessment of an accidental pollution risk from the operational mines using checklists based on the related products of the ICPDR and the provisions of the EU Seveso II Directive and the UN/ECE Convention on the Transboundary Effects of Industrial Accidents;				Legal acts	
				Programmes/ Projects	
				Research/ Monitoring	
Elaboration of inventory of abandoned sites contaminated by waste disposal and by former industrial activities including abandoned tailing deposits with special attention given to risk of flooding or leaking			Research/ Monitoring (BA_Fed)	Legal acts	
			Investments-Construction (BA_Fed)	Programmes/ Projects	
				Research/ Monitoring	

Annex IV Financing of measures

Implementation of EU UWWTD and related actions (for non-EU MS) are measures that in the 2nd Sava RBMP PoM aim at addressing several SWMIs, organic and nutrient pollution, ground water quality and protected areas.

Implementation of the EU UWWTD and its requirements aiming at water protection, improvement of public health, and reduction the environmental impact of urban wastewater. It comprises several main actions related to expansion and construction of WWTPs and sewage networks, compliance with effluent standards and integration with River Basin Management Plans to ensure alignment of wastewater management with river basin management in terms of pollution reduction on a river basin scale.

In accordance with the implementation progress assessment in all Sava countries, implementation status of this measure is ongoing which makes significant contribution for mitigation of the negative impact of untreated or inadequately treated wastewater on surface and groundwater quality, and protected areas.

As one of the main advancements in the 2nd Sava planning cycle (mentioned in Chapter 1.1), significant improvement in Urban Wastewater Treatment Directive implementation in comparison to the 1st Sava RBMP was recognized by:

- Agglomerations' delineation performed in a majority of countries (SI, HR, RS, and ME),
- Increased number of PE connected to the sewage networks,
- Decreased PE load, which is neither connected to sewage system nor treated on the wastewater treatment plants
- Share of 28% of all agglomeration PE >2.000 PE that are not connected to a sewerage collection system nor to a wastewater treatment plant (in comparison to 40% from the1st Sava RBMP).
- Significant decrease (by 53% of BOD5 and by 57% for COD) of estimated total emission load, due to increased number of agglomerations with WWTPs in the basin (14% of agglomeration with WWTP in 1st Sava RBMP and 30% in the 2nd Sava RBMP mainly due to newly constructed WWTPs in Slovenia and Croatia).

The advancement indicated that significant financial resources are allocated in all Sava countries for financing the measures related to implementation of the UWWT Directive (construction of wastewater treatment plants). In Table 1, the financial resources allocated so far, as well as those planned until 2027 are presented, in accordance with the data availability.

Table 8: Investments in UWWTD implementation (rounded in million EUR)

	SI*	HR	BA		RS	ME
			BA_RS	BA_Fed		
Investments in UWWTD implementation 2009-2021	1.484,0	1.240,0	41,0	134,6	11,5	18.6
Planned Investments in UWWTD implementation 2021-2027	989,0		21,3	8,3	14,4	33,1

**Data provided for the whole territory of the Republic of Slovenia*

In recent years (data presented are for the period 2007 – 2019), SI has made significant investments in the construction and modernization of sewage systems and wastewater treatment plants, contributing to better wastewater management. These investments have helped the country progress in meeting the requirements of EU directives, particularly regarding water quality and environmental protection. The percentage of the population connected to public sewage systems and treatment plants has increased significantly, from 45,2 % to 75,4 %. The total cost of implementing wastewater collection and treatment measures, according to the Operational Program for Wastewater Collection and Treatment, amounts to €998 million. Funding sources for the 2021–2027 period include European Cohesion Funds for agglomerations larger than 2.000 PE, as well as the Recovery and Resilience Plan and the Water Fund for smaller agglomerations (under 2.000 PE). Additionally, as part of the Common Agricultural Policy, financial incentives are planned to support the construction of small wastewater treatment plants for farmers.

For HR, data on construction of wastewater drainage systems and WWTPs, for agglomerations with PE>2.000, and financial resource needed are available from River Basin Management Plan until 2027. In total, the amount allocated (planned to be allocated) for full compliance for 91 agglomerations in the Sava River Basin in HR is 1.239.802.000,0 EUR.

For BA, available were information from two entities. In BA_RS, in the period 2009-2021, in Bijeljina the WWTP (SBR technology) was built with the capacity for 40.000 PE, with the possibility for extension to 160.000 PE. The funding was ensured through different funds EBRD and EU IPAS 2009. SIDA and ORIO. Through the project, constructed are as well, approx. 50 km of primary and secondary, and approx. 90 km of tertiary sewage network. For the period 2021-2027 construction of two WWTPs is planned, with total costs of 21.300.000 EUR. The WWTP in Gradiška was planned for 21.000 PE with extension to 32.300 PE. Also, through the project, construction of approx. 30km and rehabilitation of 7km of sewage network and pumping station were planned. (Current status of the project: Suspended). Further, for the WWTP in Teslić, with capacity of 20.800 PE (planned without extension), financial resources were ensured through support of

SIDA and EIB and contribution of the municipality Teslić. Through the project besides WWTP, construction of the sewage collectors (3.7km and 1.3 km), sewage network (1.000 km), two pumping stations, and substation are planned. For BA_Fed in the period 2009-2021, total allocated amount for WWTPs was 134.638.074,55 EUR, while for the planning period until 2027, additionally 8.325.235,25 EUR is planned to be invested.

In the period from 2009-2021 for the implementation of UWWTD, 11,48 million EUR were allocated in the RS for the construction of the WWTP in Šabac, altogether with the main wastewater transport pipeline and the sewage pumping station. Further, for the period 2021-2027 the following investments are planned:

- approx. 4,18 million EUR for activities in the field of water protection from pollution, on the territory of the municipalities/cities of Bogatić, Gornji Milanovac, Loznica, Ljubovija, Nova Varoš, Osečina, Sjenica, Tutin, Šabac and Užice;
- approx 7,07 million EUR for the construction of WWTP for 16.500 PE in Valjevo (the selection of contractors is ongoing; contracting is expected in November);
- approx. 3,14 million EUR for the construction of 12 km of primary sewage network in Valjevo - Divčibare (the selection of the contractor is ongoing; contracting is expected in December).

For ME, data were available from the Municipal Wastewater management Plan for Montenegro (2020-2035), prepared by the Ministry of Sustainable development (now Ministry of Ecology), through the project "Revision of Master Plans for Urban Wastewater Management Measures and Development of a Plan for the Implementation of the Urban Wastewater Treatment Directive 91/271/EEC". Data are available from the year 2019, which for the years 2019 -2021, makes investments of 18.622.000,0 EUR (for rehabilitation of existing and further construction of sewage network needed, construction of WWTPs, and sludge management activities). Further, 33.068.000,0 EUR is planned for the same purposes to be allocated for measures in the water management sector for the period 2021-2027.