

Sava River Basin Management Plan

Background Paper No. 5 **Significant Water Management Issues**

March 2013



This document has been produced with the financial assistance of the European Union. The contents of this document are the sole responsibility of the beneficiaries and can under no circumstances be regarded as reflecting the position of the European Union.

Table of contents

1. Introduction	1
2. Rationale	2
3. Cross Cutting Issues	3
3.1 Interrelation between the international, national and sub-national level of River Basin Management Plans	3
3.2 EU WFD environmental objectives, visions and managements objectives for the Sava River Basin	3
3.3 Basin-wide approach	5
3.4 Programme of Measures	5
4. Significant Water Management Issues	6
4.1 Surface waters	7
4.1.1 Organic pollution	7
4.1.2 Nutrient pollution	8
4.1.3 Hazardous substances pollution	8
4.1.4 Hydromorphological alterations	9
4.2 Groundwater	10
4.2.1 Groundwater quality	10
4.2.2 Groundwater quantity	11
5. Other pressures and impacts	11
5.1.1 Quantity and quality aspects of sediments as pressures and impacts	11
5.1.2 Invasive alien species	11
5.1.3 Water demand management	12
5.1.4 Other issues	12
6. Integration of water protection in developments in the Sava River Basin	13
6.1 Floods	13
6.2 Navigation	14
6.3 Hydropower	15
7. Summary	16

1. Introduction

In 2001, being aware of essential need for cooperation in the sustainable use and protection of valuable resource, the four riparian countries of the Sava River Basin (Croatia, Bosnia and Herzegovina, Yugoslavia (later Serbia & Montenegro, later Serbia) and Slovenia entered into a process of negotiation, which led to the Framework Agreement for the Sava River Basin (FASRB). It was a unique international agreement, which integrated all aspects of the water resources management and established the (joint) International Sava River Basin Commission (ISRBC) for the implementation of the FASRB, with legal status of an international organization.

The FASRB and the Sava Commission were set up with the aim of providing a platform for cross-border cooperation for the protection of water and water-related ecosystems in the Sava River Basin in order to complement the overarching cooperation in the Danube and Black Sea Region.

The FASRB was signed in 2002, ratified by the Parties in subsequent years and finally entered in force at the end of 2004. By the terms of the FASRB the Parties have agreed to work jointly on:

- Establishment of an international navigation regime on the Sava River and its navigable tributaries;
- Establishment of the sustainable water management;
- Undertaking of measures for prevention or restriction of hazard, as well as the reduction and elimination of detrimental effects of floods, ice, droughts and accidents related to emissions of hazardous substances into the water.

The most important and challenging joint effort of the Parties towards sustainable water management has been the preparation of an integrated Sava River Basin Management Plan (RBMP).

All the activities of the Sava Commission should be seen in the wider context of the river basin management planning for the Danube, which is being prepared by the International Commission for the Protection of the Danube River (ICPDR) in cooperation with the countries of the Danube River Basin District. However, the specific characteristics and challenges in the Sava basin will not be addressed exhaustively through the ICPDR work, as sub-basins like the Sava are preparing the detailed river basin management plans at sub-basin level.

The EU Water Framework Directive (WFD) is a comprehensive piece of European environmental legislation which came into force in December 2000. It established new and better ways of protecting and improving the water environment with the overall objective of achieving coordinated and integrated water management across Europe.

The overview of the significant water management issues (SWMI) is an important statutory requirement of the WFD for all river basin districts. This overview should set out the key issues affecting the water environment in the Sava River Basin (SRB). The report builds on the work of the Sava River Basin Analysis Report (Article 5 characterization and impacts analyses) published in 2009, and is an intermediate step in the preparation of the River Basin Management Plan for the Sava River Basin.

Between 2001 and 2007 the UNDP/GEF Danube Regional Project (DRP) supported and complemented the activities of the ICPDR to provide and sustain a regional approach to the development of national water management policies and legislation in the Danube River Basin. The pilot project for the development of a Pragmatic Sava RBMP constituted an activity (Component 1.1-9) within the DRP's objective regarding the "Creation of sustainable ecological conditions for land use and water management". That assignment was based on the outputs and outcomes of UNDP/GEF DRP Phase 1 (April 2003 to February 2004) in which important data and information on water management and socio-economic issues of the WFD have been collected in Slovenia, Croatia, Bosnia & Herzegovina and Serbia & Montenegro and, among other products, a short report on list of preliminary key transboundary issues for the Sava River Basin was prepared. The UNDP/GEF report benefited from the regional Key Water Management Issues (KWMIs) workshop in November 2006 in Sarajevo.

2. Rationale

The International Sava River Basin Commission (ISRBC) is the coordinating platform to compile basin-wide issues of the Sava River Basin Management Plan (RBMP). The first milestone of the Sava RBMP was the Sava River Basin Analysis Report that reflected a comprehensive analysis of the Sava River Basin including the characterisation of transboundary surface- and groundwater bodies, identification of their significant anthropogenic pressures/impacts as well as the aspects of water quantity, water use, flood management and navigation. The analysis report thus addressed all relevant aspects of the integrated river basin management and forms a good basis for any further steps to compile the Sava RBMP including the Programme of Measures.

As a follow-up, the ISRBC document on Significant Water Management Issues (SWMIs) should serve as the first outline of the Sava RBMP describing its overall scope as well as the approach how to achieve it. It should highlight the general cross-cutting issues between the SWMIs in the Sava River Basin.

The analysis of pressures in the Sava River Basin Analysis Report was finally structured according to the relevant water management issues. It included:

- Organic pollution;
- Nutrient pollution;

- Pollution by hazardous substances;
- Pressures by hydromorphological alterations:
 - River and habitat continuity interruption;
 - Disconnection of adjacent wetlands/floodplains;
 - Hydrological alterations;
 - Future infrastructure projects.
- Among other discussed significant anthropogenic pressures were:
 - Invasive species;
 - Accidental pollution.

The issues of flood management, water use and navigation were addressed in the Sava River Basin Analysis Report as well. Separate annexes were developed for the navigation and flood issues. Management of sediments was addressed marginally mainly under hydromorphological alterations.

3. Cross Cutting Issues

Cross cutting issues define general principles for setting the common frame to move toward the development of the Sava RBMP.

3.1 Interrelation between the international, national and sub-national level of River Basin Management Plans

River basin management plans and programmes of measures according to the WFD are being developed on three scales in the Danube RBD, which are:

1. The international level (Part A);
2. The national level (Part B) and/or the internationally coordinated sub-basin level (Part B) for selected sub-basins (Sava);
3. The sub-unit level (Part C).

The information increases in detail from the Part A to Part B and C. According to this concept the Sava RBMP is internationally coordinated at level B and is based on findings and actions on the national (or sub-unit) level. The interrelation between the different levels is manifold and should be exploited in the best possible way to achieve the objectives on all levels in the most efficient way. Adverse overlaps and duplication of work should be prevented.

3.2 EU WFD environmental objectives, visions and managements objectives for the Sava River Basin

The WFD requires that Member States implement the necessary measures to prevent the deterioration of the status of all bodies of surface water and that the following environmental objectives are achieved by 2015:

- Good ecological/chemical status of surface water bodies;
- Good ecological potential and chemical status of HMWBs and AWBs;
- Good chemical/quantitative status of groundwater bodies.

The Sava RBMP provides an overview of the status assessment results for surface water bodies and groundwater bodies for the entire Sava RB as well as risk assessment classifications where data is not available and/or WFD compliant methods are not applied. In order to ensure a complementary approach at the basin-wide level which is of use for national planning and implementation, visions and specific management objectives have been defined for all SWMIs and groundwater bodies. These provide guidance for Sava countries with regard to attaining agreed goals of basin-wide importance and also assist with the achievement of the overall WFD environmental objectives. The visions are based on common values and describe the principle objectives for the Sava RB. The respective management objectives describe the first steps towards the environmental objectives in the Sava River Basin in an explicit way. Basin-wide management objectives:

- Have to be described in a quantitative, semi-quantitative or qualitative way. They can be achieved through implementation of measures that need to be taken to reduce/eliminate existing significant pressures for each SWMI and groundwater on a basin-wide basis.
- Help to bridge the gap between measures on the national level and their agreed coordination on the basin-wide level to achieve the overall WFD environmental objectives. Measures at the national level can thus be complemented by the international level in such a way that they are effective in reducing and/or eliminating the existing impacts on the water status on the basin-wide scale.
- Help to illustrate the implementation success of a measure by comparing the current implementation status with the management objective.

Given the specific situation in non-EU countries, measures to achieve agreed management objectives will be implemented within a timeframe which is realistic and acceptable for all non-EU countries. In the EU MS (Slovenia) and an Accession state (Croatia), these measures are to be implemented according to the commitments and deadlines set down in the accession treaties with the EU. More specifically, the deadline for implementation of Directive 91/271/EC (organic pollution) is 2017 for Slovenia and 2023 for Croatia.

3.3 Basin-wide approach

The Sava RBMP will follow the principle of the basin-district-wide approach, as the added value for an international RBM Plan is obvious:

- Coordination of actions can increase effectiveness and efficiency;
- Sharing of experience, information and transformation of relevant issues to the basin-wide scale;
- Sharing of national approaches and improvement of their comparability (e.g. criteria for final HMWB designation, monitoring and status assessment methods, etc.);
- Communication and information flow is improved (accident emergency warning system);
- Joint assessment and management of transboundary water-related problems including lessons learned for other countries in the basin;
- Creating solidarity between the countries sharing the same river basin.

Taking into account the scale of management for the Danube River Basin the Sava countries agreed upon following thresholds for collection of national measures for the Programme of Measures:

- The Sava River and its tributaries with a catchment size of >1,000 km² and rivers of a basin-wide importance (Sotla/Sutla, Lašva and Tinja; area <1,000 km²);
- Trans-boundary and national GWBs which are important due to the size of the groundwater body (area >1,000 km²), or for those < 1,000 km² trans-boundary GWBs which are important due to various other criteria, e.g. socio-economic importance; uses, impacts, pressures, interaction with aquatic eco-system.

3.4 Programme of Measures

Programme of Measures responds to all significant pressures in order to achieve the agreed management objectives and visions on the basin-wide scale. It builds upon the results of the pressure analysis, the water status assessment and includes the measures of basin-wide importance oriented on the agreed visions and management objectives. It is based on the national programmes of measures (which in the EU MS shall be made operational until December 2012), however the specific situation in the accession and non-EU countries has to be taken into account.

Priorities for the effective implementation of national measures on the basin-wide scale have to be highlighted and are the basis of further international coordination. The Programme of Measures has to be structured according to the SWMIs agreed for the Sava River Basin (including the candidate issues after confirmation of their significance for the Sava River Basin).

The Programme of Measures should represent more than a list of national measures as the effect of national measures from the basin-wide perspective has to be estimated. The implementation of measures of basin-wide importance should be ensured through their respective integration into the national programme of measures of each Sava country. A continuous feedback mechanism from the international to the national level and vice versa will be crucial for the achievement of the environmental objectives in the Sava River Basin.

4. Significant Water Management Issues

The SWMIs are the pressures acting on the water environment that we consider as putting our ability to achieve the environmental objectives of the WFD most at risk. Issues may arise from: on-going human activity (e.g. farming, industry), historic human activity (e.g. abandoned mines, contaminated sites) and a new development (e.g. future infrastructure projects).

Based on the analysis of pressures and an agreement of the Sava RB countries the following issues are included in the Sava RBMP as SWMIs:

- Organic pollution
- Nutrient pollution
- Hazardous substances pollution
- Hydromorphological alterations
- Ground water quality

An important input for the definition of SWMIs has been received from the Sava River Basin stakeholders at the SWMI Workshop, which took place in Zagreb in September 2010. Based on the presented information it has been recommended to include aspects of ground water quality among the SWMIs. It has also been concluded that there is currently insufficient information on (i) pressures and impacts to groundwater quantity, (ii) quantity and quality aspects of sediments as pressures and impacts, (iii) invasive species and (iv) water demand management, which should therefore be considered as candidates for SWMIs in future RBM planning cycles. These candidate SWMIs are addressed hereunder the other pressures and impacts.

Floods, navigation and hydropower issues were considered of very high importance in the Sava River Basin and therefore suggested by the PEG RBM to be addressed in more detail separately from the SWMI on hydromorphology,

The WFD requires that environmental priorities, economic considerations and social issues have to be considered and taken into account when setting water management

objectives. This should ensure that the WFD is implemented cost-effectively. This approach has been taken by setting the management objectives for the Sava River Basin. The below chapter provides details on visions and management objectives for all SWMIs in the Sava River Basin and also suggests the visions and management objectives for the candidate SWMIs. The definition of visions and management objectives is given in the previous chapter.

For selected SWMIs the management objectives are given for two planning periods: 2015 respecting the end of the 2nd RBM planning cycle, and the follow up cycles taking into account the real possibilities of Non EU countries to implement the EU legislation.

The visions and management objectives for each SWMI form the basic structure of the Programme of Measures in the Sava RBMP.

4.1 Surface waters

The concept of visions and management objectives paves the way towards achievement of the environmental objectives according to the WFD. It builds on the national measures that are already in place and outlines the actions to be taken in the forthcoming river basin management cycles to achieve good water status.

4.1.1 Organic pollution

Organic pollution can cause significant changes in the oxygen balance of surface water. As a consequence, it can impact the composition of aquatic species/populations and therefore also the water status. Organic pollution is mainly caused by the emission of partially treated or untreated wastewater from agglomerations, industry and agriculture.

Many agglomerations in the Sava River Basin have no, or insufficient, wastewater treatment and are therefore key contributors of organic pollution. Direct and indirect discharges of industrial wastewaters are also important. Industrial wastewater is frequently insufficiently treated or is not treated at all before being discharged into surface water (direct emission) or public sewer systems (indirect emission).

Vision for organic pollution is no emission of untreated wastewaters into the waters of the Sava River Basin.

Management objective:

Phasing out all discharges of untreated wastewater from towns with >2,000 population equivalents and from all major industrial and agricultural installations.

4.1.2 Nutrient pollution

Nutrient pollution – particularly nitrogen (N) and phosphorus (P) - can cause the eutrophication¹ of surface water. Nutrient pollution is a priority challenge for the freshwater.

The Sava River is the third longest tributary of the Danube and discharges the largest volume of water into the Danube of all its tributaries. With regard to nutrients, it discharges into the Danube approx. 1.79 – 6.89 kt/a of total P and 37.86 – 85.59 kt/a of total N².

Visions for nutrient pollution is the reduction of nutrient emissions from point and diffuse sources in the Sava River Basin in order to avoid any negative impacts from eutrophication to the waters of the Sava River Basin.

Management objective:

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.

4.1.3 Hazardous substances pollution

Hazardous substances include man-made chemicals, naturally occurring metals, oil and its compounds and numerous emerging substances, e.g. endocrine disruptors, personal care products and pharmaceuticals.

Sources of hazardous substances are primarily industrial effluents, storm water overflow, pesticides and other chemicals applied in agriculture as well as discharges from mining operations and accidental pollution. Atmospheric deposition may also be of significance for some substances.

The Sava RB is characterised by various industrial activities, including energy production (thermo and hydro power stations), mining (coal, lead, zinc, bauxite), production of aluminium oxide, metallurgy, engineering, glass production, chemical industry, pharmaceutical, textile, pulp and paper industry, tannery and leather industries, in addition to animal breeding and the food industry – dairies, breweries, etc. Leaching from the large number of communal and industrial waste dumps in the Sava RB can also contaminate surface and groundwater.

¹ Definition of *eutrophication*: The enrichment of water by nutrients, especially compounds of nitrogen and/or phosphorus, causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned [Directive 91/271/EEC].

² This estimate was calculated from the ICPDR TNMN qualitative data from monitoring sites at Sremska Mitrovica and Ostružica using also hydrological data from the monitoring site at Sremska Mitrovica and from ISRBC and Serbian HMI Yearbooks for 2005 – 2007.

Vision for hazardous substances pollution is no risk or threat to human health and the aquatic ecosystem of the waters in the Sava River Basin.

Management objective:

Elimination/reduction of the total amount of hazardous substances entering the Sava and its tributaries to levels consistent with good chemical status.

4.1.4 Hydromorphological alterations

Hydrological alterations refer to pressures resulting from impoundment, water abstraction and hydropeaking / altered flow regime. Hydrological alterations are of local importance and do not necessarily result in basin-wide trans-boundary effects. However, the cumulative effect of water abstractions may become significant in a trans-boundary context. The key driving forces causing river and habitat continuity interruption in the Sava RB are primarily hydropower (78%), water supply (10%), and flood protection (6%).

Vision for hydromorphological alterations is the balanced management of past, ongoing 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.

Management objectives:

- Anthropogenic barriers and habitat deficits do not hinder fish migration and spawning;
- Floodplains/wetlands in the Sava RB are protected, conserved and restored ensuring the development of self-sustaining aquatic populations, flood protection and pollution reduction in the Sava RB;
- Improvement of hydrological alterations does not affect the aquatic ecosystem with regard to its natural development and distribution;
- 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.

The following management objectives are proposed for each type of hydrological alteration:

- Impoundments: Impounded water bodies are designated as heavily modified and therefore a good ecological potential needs to be achieved. Due to this fact, the management objective foresees measures at the national level to improve the hydromorphological situation in order to achieve and ensure this potential;

- Water abstractions: The management objective foresees the discharge of a minimum ecological flow, ensuring that the biological quality elements have a good ecological status or good ecological potential;
- Hydropeaking: Water bodies affected by hydropeaking are designated as heavily modified and a good ecological potential must be achieved. Therefore, the management objective foresees measures at the national level to improve the situation to achieve and ensure this potential.

4.2 Groundwater

This issue covers also the issue of “drinking water supply” identified as relevant at the SWMI workshop.

4.2.1 Groundwater quality

Groundwater in the Sava River Basin is of significant importance, mostly as a source of public water supply for population and industry, however the impacts to the groundwater dependent terrestrial ecosystems must be taken into account as well. Indication of pollution of groundwater in the urban as well as agricultural areas is evident. 30 % of the important GWBs are assessed to be in poor chemical status or at possible risk of failure to achieve good chemical status, mostly due to the influence from urban zones (non-sewered settlements and leakages from waste disposal sites) and agriculture activities.

Vision for groundwater quality is that the emissions of polluting substances do not cause any deterioration of groundwater quality in the Sava River Basin, also taking in consideration the potential impacts of climate change in future. Where groundwater is already polluted, restoration to good quality will be the goal.

Management objectives:

- Prevention of pollution in order to avoid a deterioration of groundwater quality and to attain a good chemical status in GWBs;
- Elimination/reduction of the amount of hazardous substances and nitrates entering groundwater bodies in the Sava River Basin to prevent the deterioration of groundwater quality and to prevent any significant and sustained increase in the concentrations of pollutants in groundwater;
- Reduction of pesticide/biocides emission into the Sava River Basin;
- Increase of wastewater treatment efficiency in order to avoid GW pollution from urban and industrial pollutions sources.

4.2.2 Groundwater quantity

The vision for groundwater quantity is that 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.

Management objective:

Prevent over-abstraction from GWBs within the Sava River Basin by sound groundwater management.

5. Other pressures and impacts

Due to complexity of the issues listed below and a number of open questions it was not recommended to include them as SWMIs. The issues should however remain in focus of further data collection and research in order to be reconsidered in the next RBMP. Therefore the visions and management objectives for these issues were drafted and should serve as the preliminary ideas for future policy planning and as hints for further exploration of river basin management needs.

5.1.1 Quantity and quality aspects of sediments as pressures and impacts

Sediments enter river basins mainly as a result of land and channel erosion processes. Sediment balance and transport in a river is mainly determined by land use, climate, hydrology, geology, topography, morphology and hydromorphological alterations. Sediments are a highly dynamic part of the river system and are transported through the countries of a river basin. In a river system, sedimentation processes are influenced by dams, floodplains and reservoirs. The quality of sediment affects the water ecosystem. In particular, the presence of substances such as heavy metals, nutrients, pesticides and other organic micropollutants affects the attainment of a good ecological and chemical status of a river.

Management objectives:

- 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

5.1.2 Invasive alien species

Invasive alien species (IAS) has become an emerging issue in aquatic ecosystem management. The consequences of biotic invasions are diverse and interconnected, since invaders can alter the structure and function of an ecosystem. The anthropogenic spread of plants and animals is a major threat to biodiversity. Aquatic ecosystems are no

exception in this respect. The ballast water of ships, fish stocking and the introduction of aquaculture are all possible agents for the dispersal of non-indigenous species.

The vision for invasive alien species is to establish a coordinated basin-wide policy and management framework to minimize the risk of invasive alien species to the environment, economy and society. This will include a commitment to not knowingly introduce high-risk invasive alien species into the Sava River Basin.

Management objective:

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.

5.1.3 Water demand management

Sava River Basin Analysis Report concluded that it is to expect that the water use could not be considered as SWMI in the Sava River Basin until 2015. However, it is of common opinion of water managers in the basin that the water demand is an important issue and should be dealt with in the follow up RBM planning cycle after 2015.

Vision for the water demand management is that the water use in the Sava River Basin is appropriately balanced and does not exceed the available water resources.

5.1.4 Other issues

The topic of **unregulated solid & mining waste disposal** has relation to other issues, such as Hazardous substances pollution and Flood protection and therefore it was not recommended either as SWMI or candidate SWMI.

Nevertheless, it is expected that the applied measures will lead to zero impacts to human health and aquatic ecosystems in the Sava River Basin from waste produced by industrial activities including mining.

This could be achieved via implementation of the following basin-wide management objectives:

- 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.

6. Integration of water protection in developments in the Sava River Basin

The SWMIs form a basis for the preparation of the SRBMP. An important chapter in the plan is dealing with integrating water protection in other developments in the Sava basin and addressing the following:

- Identifying key developments in water related areas (e.g., of future infrastructure projects and projected future water uses such as navigation, hydropower, flood protection, agriculture,) and assessing the implications of these developments;
- Proposing integration of water protection elements in these developments;
- Assisting in the assessment of the impact of these developments on water management (in particular on ecological status).

The following topics are of very high relevance for the Sava River Basin and therefore being addressed as separate issues despite they are partially covered by the SWMIs dealing with hydromorphological alterations.

6.1 Floods

The topic is dealt with in the RBMP under the chapter on linking of RBM and FRM. It is foreseen that the sustainable flood protection in the Sava River Basin will be developed without compromising the environmental objectives of the WFD. All flood risk management activities should be planned and carried out in line with the article 9 of the Directive 2007/60/EC, which requires taking appropriate steps to coordinate the application of the EFD with the WFD, focusing on opportunities for improving efficiency, information exchange and for achieving common synergies and benefits having regard to the environmental objectives of the WFD.

The development of flood protection, prevention and mitigation policy in the Sava River Basin should be based on following actions:

- Development of the flood risk management plan for the Sava River Basin in accordance with the Directive 2007/60/EC in coordination with the reviews of the river basin management plans provided for in Article 13(7) of Directive 2000/60/EC.
- In agreement with the management objectives for hydromorphological alterations, protection, conservation and restoration of wetlands/floodplains increasing of flood protection potential while ensuring biodiversity, the good status in the connected river, and pollution reduction;
- Actions as required by the implementation of the Directive 2007/60/EC (updating reviews and reports) taking into consideration Article 9 therein.

6.2 Navigation

This topic is mostly covered by SWMI on hydromorphological alterations and future infrastructure projects and it should be dealt with in the frame of the cooperation with the other sectors, namely hydropower and floods.

It has been agreed at the SWMI Workshop that any further developments in the sector of navigation should lead towards ensuring of environmentally sustainable inland waterway transport in the Sava River Basin that would contribute to socio-economic development of the region while respecting the environmental objectives of the WFD.

The implementation of the following integrated planning principles listed in the Joint Statement on Guiding Principles on the Development of Inland Navigation and Environmental Protection in the Danube River Basin is considered as the best way to ensuring of the environmentally sustainable navigation (principles are adjusted to the Sava River Basin):

- Establishment of interdisciplinary planning teams involving key stakeholders, including Ministries responsible for transport, for water management and environment, waterway administrations, representatives of protected areas, local authorities, non-governmental organisations, tourism, scientific institutions and independent (international) experts;
- Definition of joint planning objectives;
- Setting-up a transparent planning process (information/participation) based on comprehensive data and including the environmental benchmarks and current standards required for Strategic Environmental Assessment (SEA – for qualifying plans, programmes and policies) and for Environmental Impact Assessment (EIA – for projects);
- Ensuring the comparability of alternatives and assessing the feasibility of a plan (including the costs and benefits) and/or project (including a reflection of the status quo, alternatives and non-structural measures as well as environmental and resource costs);
- Assessing if the project has a basin wide/transboundary impact;
- Informing and consulting the International Sava River Basin Commission before deciding on new developments, as well as other possibly affected countries;
- Respecting the Sava River Basin Management Plan, including its Joint Programme of Measures as the basis for integrated planning and implementation of inland waterway transport infrastructure projects, in the mean time respecting already existing environmental legislation requirements;
- Defining and ensuring the prerequisites and goals of inland waterway transport as well as river/floodplain ecological integrity, followed by a consideration of the need

to prevent deterioration, possible mitigation and/or restoration measures to achieve all environmental requirements;

- Ensuring that there are no technically viable, environmentally better and not disproportional costly alternative means to achieve the required objective, in line with the requirements of Article 4(7) of the EU WFD;
- Seeking to avoid or, if this is not possible, to minimise the impacts of structural/hydraulic engineering interventions in the river system through mitigation and/or restoration, giving preference to reversible interventions;
- Ensuring that, when planning navigation projects, the issue and respective effects of climate change are taken into account;
- Using of best practice measures to improve navigation;
- Carrying out a priority ranking of possible measures to ensure the best possible environmental as well as navigation development effect and use of financial resources;
- Ensuring flexible funding conditions for projects to enable integrated planning (including the involvement of all stakeholder groups) and adaptive implementation as well as monitoring;
- Monitoring the effects of measures and – if relevant – adapting them.

The EU Strategy for the Danube Region, Priority Area 1 “To improve mobility and multimodality” will be an excellent driver for fostering integrated planning concerning inland navigation and environmental protection.

6.3 Hydropower

Hydropower belongs to the main hydromorphological driving forces identified in the risk analyses. It is therefore essential to organize in close cooperation with the hydropower sector and all relevant stakeholders a broad discussion process with the aim of agreeing on guiding principles on integrating environmental aspects in the use of existing hydropower plants, including a possible increase of their efficiency, as well as in the planning and construction of new hydropower plants. At present a stakeholder dialogue and development of guiding principles on hydropower generation and the WFD is under preparation in the ICPDR. The aim of this activity is to facilitate the dialog between the hydropower and environmental sector in order to achieve a common understanding of the topic with the objective of developing common guiding principles on hydropower development and the WFD, as stated in the Danube Declaration 2010. Because all the FASRB Signatories adopted the Danube Declaration as well the guiding principles under development should be considered for application within ISRBC.

In general, following key recommendations should be followed in order to achieve hydropower development and ensure the environmental objectives of the Water Framework Directive are met:

- Pre-planning mechanisms allocating “no-go” areas for new hydro-power projects should be developed. This designation should be based on a dialogue between the different competent authorities, stakeholders and NGOs.
- In order to minimize the need for new sites, the development of hydropower capacities could be supported by the modernisation and the upgrading of existing infrastructures.
- The development of hydropower should be accompanied by an improvement of water ecology, through clear ecological standards for new facilities, or for existing facilities through their modernisation as well as the improvement of operation conditions. New hydropower plants should for example all have fish passages and they should respect a minimum ecological flow.
- An analysis of costs and benefits of the project is necessary to enable a judgement on whether the benefits to the environment and to society preventing deterioration of status or restoring a water body to good status are outweighed by the benefits of the new modifications. This does not mean that it will be necessary to monetise or even quantify all costs and benefits to make such judgement.
- The size of the project is not the relevant criteria to trigger Article 4.7. The relevant approach is to assess if a given project will result in deterioration of the status of a water body. Thus, projects of any size may fall under article 4.7.

Implementation of EU Strategy for the Danube Region, Priority Area 2 “To encourage more sustainable energy” would pave the way for the coordinated and sustainable development of new power stations in the future and retrofitting the existing ones in the way that would minimize the environmental impact and the impact on the transportation function of the rivers (navigation).

7. Summary

This document provided a first outline of the Sava RBMP structured according to the Significant Water Management Issues and the other issues of potential relevance still pending agreement by the ISRBC. Cross cutting issues are outlined to provide a common basis of understanding towards the final Sava RBMP.

The chapter on cross cutting issues explains the interrelationship between the internationally coordinated basin level and the national level of the RBM Plans, outlines the concept of visions and management objectives that creates a backbone of SWMI

description, lists the benefits of the basin-wide approach and explains the character of the Programme of Measures.

The proposed visions and management objectives concerning the Significant Water Management Issues should pave the way towards a commonly agreed Programme of Measures in the Sava River Basin. Their implementation should lead to achieving the WFD environmental objectives.

The document pays attention also to other issues which due to their complexity and lack of information have not been recommended as SWMIs. These issues should however remain in focus of further data collection and research in order to be reconsidered in the next RBMP. The chapter on integration of water protection with other developments in the Sava River Basin addresses the impacts of flood risk management, navigation and hydropower on achieving environmental objectives of the RBMP.