Flood Risk Management Plan for the Sava River Basin

FINAL REPORT

DECEMBER 2018

DOCUMENT CONTROL

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ABBREVIATIONS

BiH	Bosnia and Hercegovina
CBA	Cost Benefit Analysis
EU	European Union
FASRB	Framework Agreement on the Sava River Basin
FD	Directive 2007/60/EC on the assessment and management of flood risks - Floods Directive
FHM	Flood Hazard Maps
FRM	Flood Risk Maps
FRMP	Flood Risk Management Plan
GIS	Geographic Information System
HR	ISO code for Croatia
ICPDR	International Commission for the Protection of the Danube River
ISRBC	International Sava River Basin Commission
ME	ISO code for Montenegro
PEG FP	Permanent Expert Group for Flood Prevention
PEG RBM	Permanent Expert Group for River Basin Management
PEG GIS	Permanent Expert Group for GIS
PFRA	Preliminary Flood Risk Assessment
APSFR	Area with Potentially Significant Flood Risk
RBMP	River Basin Management Plan
RS	ISO code for Serbia
SI	ISO code for Slovenia
WB	The World Bank
WBIF	Western Balkans Investment Framework

REPORT STRUCTURE

This Report includes the following information:

- Chapter 1 is the Executive Summary, with summarized main points of the report;
- Chapter 2 presents the main project details (overall information about the project and its beneficiaries);
- Chapter 3 refers to the activities and the results of the project, including an overview of completion for each task as foreseen by the ToR;
- Chapter 4 includes information on project management;
- Chapter 5 briefly describes key obstacles and issues encountered;
- Chapter 6 formulates conclusions.

1 PROJECT DETAILS

1.1 PURPOSE AND GOALS

1.1.1 Purpose

The World Bank supported the implementation of a Western Balkans Investment Framework (WBIF) technical assistance aimed to improve the effectiveness of joint flood management of the countries cooperating in the Sava River basin through the project "Improvement of joint flood management actions in the Sava River Basin". The project consisted of two components:

1. **Preparation of the joint Sava FRMP (hereinafter „the Project" for the purpose of this Report);**
2. Establishment of a FFWS for the SRB.

The purpose of the Project that is the subject of this Report was to provide technical support to the International Sava River Basin Commission (hereinafter "ISRBC") and the beneficiary countries (Bosnia and Herzegovina, Serbia and Montenegro as direct beneficiaries; Croatia and Slovenia as indirect beneficiaries) related to flood risk management in the Sava River Basin.

Tasks within the project included development of the **Sava Flood Risk Management Plan (Sava FRMP)** and a number of technical background documents, containing (among other) joint objectives of flood risk management and structural and non-structural measures for achieving them. The Plan ensures that the principle of solidarity and the "no harm rule" are taken into account, so that measures planned for the territory of one country may not, by their magnitude or impact, significantly increase the flood risk on the territory of another country.

Aside from the project Terms of Reference and the Consultant's Technical Offer, the guiding documents for Sava FRMP preparation were the *Program for development of Flood Risk Management Plan in the Sava River Basin*[1], as well as the higher-level documents *Framework Agreement on the Sava River Basin (FASRB)*[2] and *Protocol on Flood Protection to the FASRB*[3].

1.1.2 Results to be Achieved

The following results had to be achieved:

1. **Prepared Sava FRMP**, including Summary of Measures with all its related components and accompanying documents (in accordance with the Program). The Plan had to be established in close coordination with the ISRBC, its Secretariat and PEG FP as the leading body inside the Commission for preparation of the Sava FRMP;
2. Carried out **public participation process**, including organization of a Stakeholder Forum;
3. Designed **FRM database module** and implemented into **SavaGIS**;
4. Prepared **Follow-up strategy**.

[1]http://www.savacommission.org/dms/docs/dokumenti/documents_publications/basic_documents/program_sava_frm_plan/program_savafrmplan.pdf
[2] http://www.savacommission.org/dms/docs/dokumenti/documents_publications/basic_documents/fasrb.pdf
[3]http://www.savacommission.org/dms/docs/dokumenti/documents_publications/basic_documents/protocols/protocol_on_flood_protection_to_the_fasrb/protocol_on_flood_protection_to_the_fasrb.pdf

1.2 BENEFICIARIES

Project beneficiaries were Parties signatories to the FASRB (Bosnia and Herzegovina, Croatia, Slovenia and Serbia) and Montenegro[4], as well as the Secretariat of the ISRBC. Primary target groups per the ToR included competent authorities in state beneficiaries, as follows.

- Bosnia and Herzegovina:
  - Ministry of International Trade and Economic Relations of Bosnia and Herzegovina
  - Federal Ministry of Agriculture, Water Management and Forestry
  - Ministry of Agriculture, Forestry and Water Management of the Republic of Srpska
  - Public Institution "Vode Srpske"
  - Federal Hydro-Meteorological Service of BiH
  - Republic Hydro-Meteorological Service of the Republic of Srpska
  - Department for Agriculture, Water Management and Forestry, Brčko District
- Croatia:
  - Ministry of Environment and Energy
  - Hrvatske vode
  - State Hydro-Meteorological Service of Croatia
- Serbia:
  - Ministry of Agriculture, Forestry and Water Management – Republic Directorate of Water
  - Public Water Management Company "Srbijavode" Belgrade
  - Public Water Management Company "Vode Vojvodine" Novi Sad
  - Public Water Management Company "Beogradvode"
  - Republic Hydro-Meteorological Service of Serbia
  - Provincial Secretariat for Agriculture, Water Management and Forestry
- Slovenia:
  - Ministry of Environment and Spatial Planning
  - Water Directorate of the Republic of Slovenia
  - Environmental Protection Agency of the Republic of Slovenia
  - Directorate for Emergencies of the Republic of Slovenia
- Montenegro:
  - Ministry of Agriculture and Rural Development
  - Service for Hydro-Meteorology and Seismology of Montenegro.

For more information on overall management of the project and coordination mechanisms with the parties involved, kindly refer to **Chapter 4 – Project Management**.

1.3 OVERVIEW OF THE SCOPE OF SERVICES

The following activities and tasks were envisaged during the project implementation:

A. Inception Phase

1. Organisation of all aspects of the project start;
2. Review of relevant legal bases, previous studies and other background information;

[4] Based on Memorandum of Understanding on cooperation between the International Sava River Basin Commission and Montenegro, signed on December 9, 2013 in Belgrade.

3. Gap analysis: identification of all gaps in the collection and availability of data and information that need to be resolved for the development of the Sava FRMP;
4. Project kick-off meeting;
5. Inception meeting and inception report.

B. Establishing elements of the Sava Flood Risk Management Plan

1. Draft the first outline of the Sava FRMP;
2. Elaborate Summary of the conclusions relevant for the basin, drawn from the Preliminary Flood Risk Assessment (PFRA);
3. Elaborate Summary of the conclusions relevant for the basin, drawn from the flood hazard and risk maps (FHRM);
4. Provide assistance to the ISRBC Secretariat and beneficiaries to define the goals of flood risk management of common interest in the Sava River Basin;
5. Define the measures to achieve goals relevant for the basin as a whole, including "Summary of Measures" (sets of concrete structural and non-structural measures relevant for the entire river basin) and proposal for "Catalogue of Measures" (sets of concise and manly aggregated general structural and non-structural measures);
6. Prepare an Environmental Impact Analyses for the "Summary of Measures" that should ensure ecological foundations for identification of special environment protection requirements;
7. Define mechanisms of coordination on the basin-wide level;
8. Elaborate Proposal of Modes of cooperation of the Sava countries in the flood defence emergency situations including the arrangements in the basin for forecasting and warning;
9. Finalise Sava FRMP based on the above documents.

C. Design the FRM database module and implement it into SavaGIS

1. Develop the FRM database module and integrate it into SavaGIS;
2. Prepare the technical report / user documentation.

D. Involve stakeholders and the public

1. Prepare and implement the process for public information and consultation, in coordination with the ISRBC Secretariat;
2. Organise a Stakeholder Forum to discuss the findings of the draft FRMP.

E. Prepare Strategy for Follow-up

Overview of all the Project tasks listed above and their completion status is provided in **Table 2**.

2 ACTIVITIES IMPLEMENTED AND RESULTS ACHIEVED

2.1 INCEPTION PHASE

Main output - document: **Inception Report**

The Inception Phase was successfully completed. During this phase, the following activities were performed.

2.1.1 Organisation of all aspects of the project start

During this activity, all the basic tasks for starting and maintaining the project were completed by end of May 2017, including full mobilisation of the project team and establishment of the poject office in Zagreb (Charlesa Darwina 8/V).

2.1.2 Review of relevant legal bases, previous studies and other background information

As part of this phase of the Inception Period, the project team undertook a detailed analysis of all relevant documents on national and international level. These included: ISRBC documents which were the framework for Sava FRMP preparation; national strategies, plans, regulations and other documents; international documents and relevant requirements (eg those related to EU Flood Directive and WFD); reports from other relevant projects (eg WATCAP project).

A dedicated analysis was also performed on information available in Sava GIS, including APSFR information and flood hazard and risk maps uploaded by the countries.

Conclusions of each of these analyses were published as part of the Inception Report.

2.1.3 Gap analysis

During the Inception Phase, gaps and issues with the available information were identified. The main obstacles detected at that time were related to very heterogeneous information available, such as the structure of national data on APSFRs and different methodologies used for flood maps. More information on these are provided in **Chapter 5** of this report.

2.1.4 Project kick-off and other meetings

Meetings were held with the ISRBC Secretariat, the beneficiary countries, and PEG FP. The Kick-off meeting was organised on 26/4/2017. Minutes of all the meetings were provided as part of the Inception Report.

2.1.5 Inception report

Final version of the Inception Report was completed in October 2017, which includes more detailed information on each of the steps listed above.

2.2 SAVA FLOOD RISK MANAGEMENT PLAN FOR THE SAVA RIVER BASIN

Main outputs – documents: **Sava FRMP (main document)** and **Sava FRMP Atlas.**

This activity included the preparation of the main Sava FRMP text, with all the elements as requested by the ToR and the Program. During the Project implementation, it was agreed with the ISRBC Secretariat and confirmed by PEG FP to also prepare an Atlas of maps as a separate document, so that the maps could be shown in appropriate size without all of them being in the main text.

Tasks related to Background Documents are covered in **Chapter 3.3**.

2.2.1 Sava FRMP main text

The complete draft of the Sava FRMP text was completed in second half of 2018 and confirmed by ISRBC Secretariat and PEG FP following the public consultation process which is described in **Chapter 3.5**.

Sava FRMP summarises the analysis and conclusions from individual background documents, produced within project activities further described in sections below. Therefore, for more detailed information on specific Sava FRMP topics, please check the corresponding background document section.

For the Sava FRMP preparation, a total of 1,926 potential flood areas were considered across all beneficiary countries. Out of those, 251 areas were identified as significant for flood protection in the basin. Those 251 potential flood areas, covering around 5.8% of the basin and 1.4 million inhabitants, were then grouped to form Areas of Mutual Interest for Flood Protection (AMI), as the main analysis unit in the Plan. In total, 21 AMIs were identified on Sava and its main tributaries.

Mutual objectives of flood risk management were agreed on the basin level. To achieve these, the Plan identified 42 non-structural measures divided into 11 categories, as well as 38 national structural measures in Areas of Mutual Interest. All the measures (with a focus on structural ones) were screened, including:

1. Available technical and other information;
2. Cross-border impacts;
3. Spatial distribution;
4. Potential environmental influences;
5. Relation to environmental goals of WFD and Sava RBMP;
6. Contribution to adaptive capacities for climate change.

For non-structural measures, those that will contribute to quantity and quality of information in the next planning period were considered to be a priority. Structural measures were proposed by the countries (these are national measures recognised in official national documents).

The Plan also analysed coordination mechanisms between the countries on the basin level, and especially methods of cooperation in emergency flood situations. A set of recommendations is provided for both.

As part of the Plan, two methodologies were developed, and can be further improved and used by the Sava FRMP countries:

- Joint methodology for preparing flood hazard and risk maps;
- Simplified methodology for assessing costs and benefits of proposed measures (hereinafter “CBA methodology”).

2.2.2 Sava FRMP Atlas

Sava FRMP Atlas document contains spatial view of the thematic layers used during the preparation of the Sava FRMP. All maps are in ETRS 1989 LAEA Coordinate system (WKID: 3035 Authority: EPSG) in Lambert Azimuthal Equal Area projection, Central Meridian: 100, Latitude of Origin 520, Linear Unit: Meter (1,0). The display scale for maps was determined so that content can be placed on the A3 page format (landscape, 42 x 29.6 cm). For maps showing entire area of the Sava river basin was defined scale 1:1,800,000 and for maps showing details was defined scales 1:250,000 and 1:125,000. Details display maps are sorted into pages according to the scheme that is displayed in the Atlas.

The Atlas includes the following maps:

1. Flood Events in the Sava River Basin;
2. Areas with Potential Significant Flood Risk in the Sava River Basin;
3. Areas of Mutual Interest in the Sava River Basin – Scheme of pages;
4. 11 maps detailing Areas of Mutual Interest in the Sava River Basin;
5. 11 maps showing Flood Risk for Human Health;
6. 11 maps showing Flood Risk for Economic Activities;
7. 11 maps showing Flood Risk for Environment.

The content, spatial layers, shown on the maps were used directly from the central Sava GIS Geodatabase. When creating maps, Esri Basemaps were used in raster format as a background. While developing Flood Risk maps, for Human Health and Economic activity receptors, were used data from Eurostat (Geostat – Population grid 2011) and from European Environmental Agency (Corine Land Cover – CLC 2012).

2.3 BACKGROUND DOCUMENTS

Each of the Background Documents produced within the Project is described in the sections below.

2.3.1 Summary of the conclusions relevant for the basin drawn from the Preliminary Flood Risk Assessment (PFRA)

Main output – document: **Summary of the conclusions relevant for the basin drawn from the Preliminary Flood Risk Assessment**

This background document analyses the national data on PFRA, as well as the document Sava PFRA prepared in 2014 for the basin level. Data for Republika Srpska, Brcko Distrikt BIH and Montenegro were processed during Sava FRMP preparation by the project.

As part of this document, key elements on national PFRA methodologies were considered, and national information summarised. Major past flood events for which data was registered in Sava GIS were analysed, especially the catastrophic 2014 flooding. The document includes the analysis of potential flood areas and identification of 251 significant for the basin, which were then grouped in the previously mentioned AMIs. Flood protection infrastructure was also identified and described. Numerical data is provided for each AMI (eg population under risk), as well as the list of APSFRs included in each of these areas.

2.3.2 Summary of the conclusions relevant for the basin, drawn from the flood hazard and risk maps (FHRM)

Main output – document: **Summary of the conclusions relevant for the basin, drawn from the flood hazard and risk maps**

In this background document, analysed were the national flood hazard and risk maps and methodologies for each country in the basin, and conclusions given. Based on these, numerical flood risk data was provided for each AMI. Flood maps were produced as part of the Sava FRMP Atlas document. The approach of identifying flood risks for each AMI were described in detail.

This background document also includes the Joint methodology for preparing flood hazard and risk maps, as well as a chapter on testing the methodology on an example area.

2.3.3 Goals of flood risk management of common interest in the Sava River Basin

Main output – document: **Goals of flood risk management of common interest in the Sava River Basin**

For defining the goals of flood risk management on the basin level, analysed were the objectives set in national strategic documents of each Sava River basin country, and the available documents for the Danube River Basin (ICPDR).

This led to the following five main flood risk management objectives of mutual interest in the Sava River Basin:

1. Avoiding new flood risks;
2. Reduction of existing risks;
3. Strengthening resilience;
4. Raising flood risk awareness;
5. Implementation of the solidarity principle.

2.3.4 Catalogue of measures

Main output – document: **Catalogue of measures**

The background document Catalogue of Measures sets 17 measure types within 5 aspects: flood prevention (M21-M24), flood protection (M31-M35), readiness (M41-M44), recovery and revision (M51-M53), and other (M61). This catalogue is then used in the Summary of Measures. The document also lists measures of each Sava River Basin Country, as well as those related to Sava but identified in the Danube FRMP.

2.3.5 Summary of measures

Main output – document: **Summary of measures**

This is a key background document for identifying and assessing non-structural and structural measures in the Plan. As noted above, 42 non-structural measures and 38 national structural measures in AMIs are identified in the Plan. This document gives detailed tables on both types of measures, and provides the following analyses.

- Spatial distribution;
- List of measures affecting water retention capacities;

- Cross-border impact of measures;
- Summary of relation with the WFD/Sava RBMP: each measure was screened and grouped into one of 3 categories: 1) Supports the env. objectives of the WFD; 2) Potentially in conflict with the env. objectives of the WFD; 3) Neutral to the env. objectives of the WFD;
- Summary of preliminary assessment of environmental impact: each measure was screened and grouped into one of 3 categories: 1) Major potential impact; 2) Medium potential impact; 3) Low potential impact. It should be emphasised that this screening was only preliminary and based on available information. Each structural project is subject to EIA and other requirements according to relevant national and international regulations. Therefore, the conclusions of analysis within the Summary of Measures should be understood as preliminary indications of potential environmental impact, but not in any way a replacement for more comprehensive studies;
- Indicative significance of measures for adaptation capacity on climate change: all measures were grouped into one of three groups: 1) Major significance; 2) Medium significance; 3) Low significance;
- Funding sources: potential funding sources for each measure were identified.

2.3.6 Simplified methodology for assessing costs and benefits of proposed measures (CBA methodology) and the CBA Excel model

Main output – document: **Proposal of main elements of a simplified methodology for assessing costs and benefits of measures (CBA methodology)** with an accompanying **Excel model**

This background document includes proposals for a common CBA methodology that can be used by the countries in case of joint projects and when a more detailed "full" CBA has not been performed yet. It is based on quantification of flood damages that could be avoided by each proposed measure. The document explains the basis of the CBA approach, steps for undertaking the analysis, the theoretical basis of the proposed methodology, and then explains the developed CBA model in Excel. Three main aspects are covered: human health, environment, and economic activities. Based on the inputs, the CBA model provides the user with basic criteria for selecting/prioritising measures based exclusively on economic parameters.

2.3.7 Existing and potential retentions

Main output – document: **Existing and potential retentions**

This background document analyses existing documentation (eg studies) regarding existing and potential retentions in the Sava River Basin. Based on the data gaps identified, two related non-structural measures were recommended in the Summary of Measures and the Sava FRMP main document.

2.3.8 Environmental Impact of Measures and relation to WFD/RBMP (synergies and conflicts)

Main output – document: **Analysis of proposed measures in the context of potential impacts on environment and environmental objectives of the WFD**

In order to determine the potential environmental influence of each measures and how they relate to environmental objectives of the WFD and Sava RBMP, a dedicated Info Sheet was developed for each of 38 measures including 48 project activities. These include preliminary assessment of negative

influence during construction and operation, expected positive influences, whether the measure is in protected and/or sensitive environment area, whether it has significant cross-border impact, indicative impact reduction measures, as well as already mentioned measure classification based on environmental impact and relations to WFD/RBMP.

2.3.9 Mechanisms of coordination on the basin-wide level and proposal of modes of cooperation of the Sava countries in the flood defence emergency situations

Main output – document: **Mechanisms of coordination on the basin-wide level and proposal of modes of cooperation of the Sava countries in the flood defence emergency situations**

This combined background document details the institutional situation in each country, and their relationships (inc. formal agreements) when it comes to flood risk management and emergency situations. It shows how Sava GIS geoportal and Sava HIS can be used for coordination on the basin level. It gives 22 recommendations for improving cooperation, as well as a set of proposals for further upgrading the Sava GIS geoportal.

2.3.10 Climate Change and flood risk management planning for the sava river basin

Main output – document: **Climate Change and flood risk management planning for the Sava River Basin**

Preparation of this background document was agreed during the project implementation and provides climate change information relevant for food risk management planning.

2.3.11 Sava FRMP Public Participation Process Report

Main output – document: **Public Participation Process Report**

This background document details the activities for involving the main stakeholders and the public in preparation of Sava FRMP. For more information, please see **Chapter 3.5**.

2.4 DESIGNING THE FRM DATABASE MODULE AND IMPLEMENTING IT INTO SAVA GIS

Under this activity, Sava GIS was successfully upgraded, tested, and technical/user documentation produced. Please note that in this activity, PEG GIS was also involved, apart from the ISRBC Secretariat and the PEG FP.

The following outputs were delivered:

1. SavaGIS FRM database model;
2. Integration of the new model into SavaGIS with a report on this process;
3. User manuals (for registered users and admins);
4. SavaGIS testing reports;
5. Data exchange database template;
6. Technical documentation.

2.5 INVOLVE STAKEHOLDERS AND THE PUBLIC

Main outputs:

1. SavaFRMP micro webpage developed as part of ISCRBC web portal
2. Process for public information and consultations completed;
3. Stakeholder Forum organized.

Public information and participation were treated as an integral part of Sava FRMP preparation. The main objectives of this process were to receive feedback that would improve the quality of the Plan, but also raise awareness of the public about flood risk management, contributing to better conditions for Sava FRMP implementation and the next planning period.

For the purpose of informing the stakeholders and the general public about the Project and Sava FRMP preparation, a dedicated website was developed as part of the ISRBC web portal[5] (**Figure 1**). The website was also used as a platform for submitting online comments during the public consultations process.

Figure 1: Webpage dedicated to Sava FRMP

The Public Consultations process on the Sava FRMP draft was implemented from the 31st of October to the 1st of December 2018. During this period, the interested stakeholders were able to submit their comments by using an online web form on Sava FRMP website or by sending an email to ISRBC. The online form for comments is shown on **Figure 2** below.

[5] http://www.savacommission.org/sfrmp/hr/

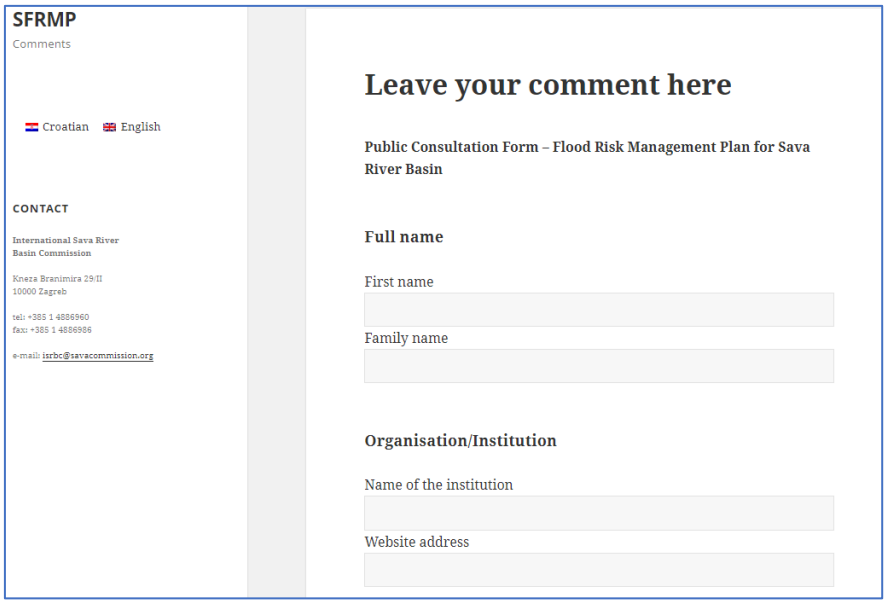

Figure 2: Online form for submitting comments on Sava FRMP

Within the public consultations period, 160 comments were received from 14 institutions. The comments were reviewed right after the consultations period. For each comment, the Project has proposed resolution and (as applicable) replies with justification to the ISCRB Secretariat and PEG FP.

62 comments were considered justified and were accepted, from which 46 caused direct changes to the Sava FRMP text. 98 comments were not accepted, with proper explanation. The ISRBC Secretariat is expected to publish the report on the public consultations process, which will be based on the report delivered during the Project implementation.

2.5.1 Organise a Stakeholder Forum to discuss the findings of the draft FRMP.

The Stakeholder Forum Workshop was organized as part of the public participation process for the draft Sava FRMP. It was held in Belgrade on 14-15 November 2018, when the first draft of the Sava FRMP was presented and discussed.

In order to obtain relevant feedback on draft Sava FRMP and increase awareness of key stakeholders about the ongoing Public Participation process, a wide range of institutions were invited to the Workshop. In total, there were more than 100 invitees.The Workshop was attended by around 50 participants from government and public institutions of the Sava River Basin countries, representatives of international organizations, non-government sector, the International Sava River Basin Commission, as well as the WBIF, the World Bank, and the project team working on Sava FRMP preparation.

The Workshop methodology was established to facilitate feedback from stakeholders and encourage them to submit their comments as part of the Public Participation process. For this reason, the Workshop included two main modes of work:

- **Plenary sessions** – with all participants being together, these sessions were used for introductory part of the event, presentations of the Plan elements and work group conclusions, discussion on future FRMP planning process, as well as the overall conclusions of the Forum;
- **Group Work sessions** – in order to allow for a more interactive discussion and participation of stakeholders, specific questions were presented for discussion in three working groups. Groups were moderated with the aim of defining specific conclusions to the questions across

all groups, which were then presented by chosen Group representatives and discussed in the plenary session.

During the workshop, each Chapter of Sava FRMP was presented in plenary sessions by experts from the Project Team. Following the plenary sessions, specific sections of the Plan and related questions were discussed in the working groups. After that, representatives of each working group presented the conclusions, which were then discussed in the Plenary sessions. Conclusions of the working groups included a number of suggestions regarding the Sava FRMP text. All participants were encouraged to submit their comments through the official methods as part of the Public Participation Process. **Table 1** shows the breakdown of participants per country/stakeholder.

Country / Stakeholder	Number
Slovenia	1
Croatia	2
Bosna and Herzegovina	7
Serbia	4
Montenegro	4
EU and international org.	4
NGOs	2
WBIF and the World Bank	3
ISRBC	3
PEG FP	6
Project Team	7
EPTISA	4

Table 1: Breakdown of Forum participants per country/stakeholder

Figure 3 below shows a photograph of Forum participants taken on Day 2.

Figure 3: Photograph of Stakeholder Forum participants (Day 2)

Materials from the Stakeholder Forum (eg presentations) are published on Sava FMPR website: http://www.savacommission.org/sfrmp/en/public_participation/show-18-stakeholder-forum-workshop.

The main output of this activity, "**Public Participation Process Report**" contains all the information about the process, including a table of all the comments received on draft Sava FRMP, as well as the list of Stakeholder Forum participants.

2.6 STRATEGY FOR FOLLOW-UP

Main output – document: **Strategy for Follow-up.**

The Follow-up strategy provides a comprehensive SWOT analysis of Sava FRMP and gives recommendations on improvements in the next planning period. The document includes and description of various funding sources that can be used for financing the measures, including the private sector (through PPPs) and the importance of insurance schemes for flood management. It notes the important role the ISRBC can have in implementing river basin level non-structural measures and supporting the countries in securing funding for their national priority projects, which would all contribute to achieving mutual objectives set in Sava FRMP.

2.7 OVERVIEW OF TERMS OF REFERENCE TASKS COMPLETED BY THE PROJECT

Table below shows an overview of all tasks completed within the project, as per the TOR designations.

No	ToR Task Designation	Task	Status
1	**A.1**	**Organisation of all the aspects of the project start**	**Completed**

2	**A.2**	**Project kick-off meeting**	**Completed**
3	**A.3**	**Review of previous studies and background data and information**	**Completed**
4	**A.4**	**Detailed gap analysis**	**Completed**
5	**A.5**	**Inception meeting / report**	**Completed**
6	**B.1**	**1st Sava FRMP outline**	**Completed**
7	**B.2**	**Summary of the conclusions relevant for the basin drawn from the Preliminary Flood Risk Assessment (PFRA)**	**Completed**
8	**B.3**	**Summary of the conclusions relevant for the basin, drawn from the flood hazard and risk maps (FHRM)**	**Completed**
9	**B.4**	**Goals of flood risk management of common interest in the Sava River Basin**	**Completed**
10	**B.5**	**Catalogue of Measures**	**Completed**
11	**B.5**	**Summary of Measures**	**Completed**
12	**B.5**	**Simplified methodology for assessing costs and benefits of proposed measures (CBA methodology) and the CBA Excel model**	**Completed**
13	**B.5**	**Existing and potential retentions**	**Completed**
14	**B.5 and B.6**	**Environmental Impact of Measures and relation to WFD/RBMP (synergies and conflicts)**	**Completed**
15	**B.7 and B.8**	**Mechanisms of coordination on the basin-wide level and proposal of modes of cooperation of the Sava countries in the flood defence emergency situations**	**Completed**
16	**C.1**	**Designe and implement the FRMP database module into SavaGIS and prepared technical documentation/user manual**	**Completed**
17	**D.1**	**Prepare and implemente process for public information and consultation in all phases of development of Sava FRMP**	**Completed**
18	**D.2**	**Organisation of a Stakeholder forum to present draft Sava FRMP, and collect comments on its content from all relevant stakeholders**	**Completed**

19	**D.3**	**Prepare a document which summarizes a public participation process**	**Completed**
20	**D.4**	**Support in publicity of the final FRMP**	**Completed**
21	**E**	**Prepare Final Sava FRMP and FRMP Atlas**	**Completed**
22	**F**	**Prepare strategy for follow-up**	**Completed**

Table 2: Tasks completed within the Project, per the ToR

As can be seen from the above table, all the tasks foreseen within the service contract were completed.

3 PROJECT MANAGEMENT

3.1 MANAGEMENT STRUCTURE

The management structure maintained during the implementation of the Project was fully compliant with requirements of the ToR. The overall contract was managed by the World Bank on behalf of the WBIF.

During work on the Project tasks, the Project Team maintained close cooperation with the ISRBC Secretariat, as its main operational counterpart. The main coordination and decision making body was PEG FP, and all project outputs (most notably Sava FRMP and the Atlas) were presented to its members and subject to commenting and approval. Notable role was also given within certain project tasks to PEG GIS and PEG RBM who were informed regularly.

In order to facilitate communication between all project stakeholders, an additional mechanism called Core Working Group (CWG) was established, as a key consultations body that reviewed and commented on Project's submissions, before the documents were officially sent and then reviewed/adopted by PEG FP. 5 meetings of CWG were held during the Project implementation.

The figure below provides an overview of the project management structure.

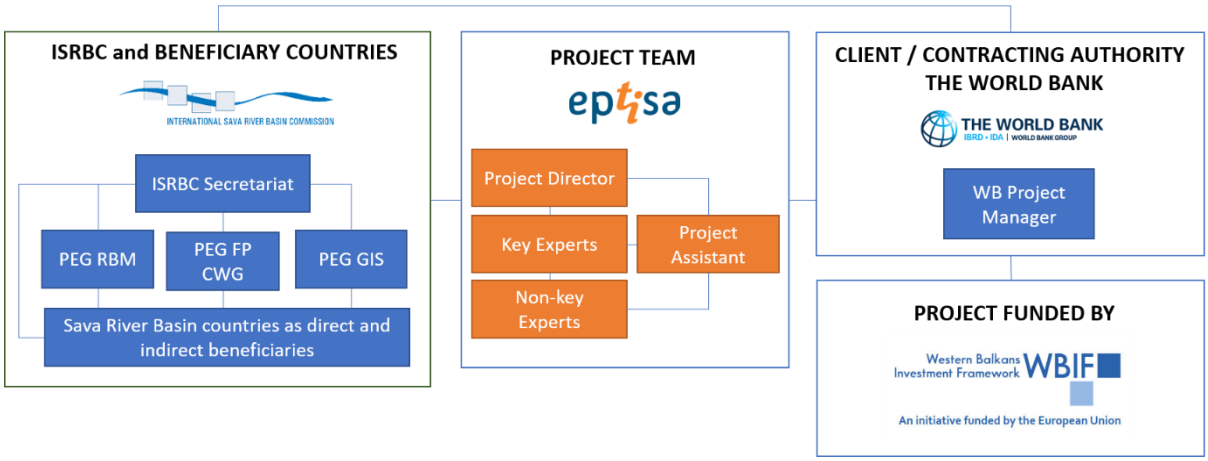

Figure 4: Project management structure

3.2 CONSULTANT'S TEAM

The consultancy for this project was delivered by a consultancy company EPTISA Servicios de Ingenieria S.L. (Spain). The table below presents the experts involved in the Project.

No.	Expert name	Position
1	Boris Scekic	Project Director
2	Visnja Omerbegovic	KE1 Team Leader
3	Duska Kunstek	KE2 Flood Management Expert (until 7/2017)

4	Predrag Srna	KE2 Flood Management Expert (from 9/2017)
5	Nijaz Lukovac	KE3 Disaster Management Expert
6	Davorin Singer	KE4 Data Management Expert
7	Zoran Bogunovic	Visibility and Communications Expert
8	Branislav Sekulovic	Environmental Expert
9	Djordje Mitrovic	Economist
10	Zeljko Pucnik	Project Assistant

Table 3: Members of the Project Team

4 ISSUES / OBSTACLES ENCOUNTERED

As shown in the previous section of the Report, all project activities were successfully completed. However, during the implementation several key obstacles were encountered and overcome in close cooperation with the ISRBC Secretariat and PEG FP / CWG, which are described below.

Obstacles in obtaining data and the data quality

Having in mind the very different circumstances in each of the beneficiary countries in sense of flooding scenarios, sources, mechanisms, scope, criteria, acceptable risks and other elements, it was not possible for the project team to foresee all the issues that may be encountered before the project started its implementation. Once the collection and analysis of data started, it become much clearer which layers and data sources could or could not be used in order to obtain results relevant for the Sava FRMP. Much of the data regarding PFRA/APSFRs and FRMs were not available in the level of readiness that was initially expected, in order for this data to be readily used as basis for Sava FRMP preparation.

Difficulties in interpreting and using the data

During the analysis and interpretation of the collected data, it was necessary to modify the data and align it so a consistent dataset can be had for all countries. For example, varying methods were used for defining APSFRs, in sense of these areas belonging to certain rivers, the surface of the country covered by APSFRs, determining the areas of influence of receptors, and other. The main effect of this was that the project had to allocate significantly more resources in order not only to verify the received data, but also modify it so that adequate results could be obtained.

Preparation of the missing data by the project

In some cases, the project itself had to work on the missing data / source documents necessary to have for the preparation of the Sava FRMP. An indicative example of this is the preparation of APSFR for Montenegro (relevant for SRB), which was a task completely out of the ToR scope. Similar situation was also encountered when trying to define the Areas of Mutual Interest (AMIs), which are an important basis for most of the other work on Sava FRMP (notably the measures). AMIs were defined as areas encompassing main route of the Sava River, as well as areas around border waterways. Initially, for creation of AMIs, it was planned to use spatial data from APSFRs, but since these were not all available in SavaGIS, it was agreed to also use all the other available information in the database, as well as those collected additionally by the project team. For these and related reasons, the preparation of statistical and graphical elements of PFRA and risk and hazard maps took significantly more resources of the project than originally anticipated based on the ToR and existing documents.

As noted previously, all the listed obstacles were overcome and Sava FRMP and other outputs of the project delivered as per the service contract.

5 CONCLUSIONS

As described in the previous sections of this Report, all project tasks were successfully completed. The Sava FRMP document presents a significant step forward for mutual flood risk management in the Sava river basin, facilitating implementation of the provisions of the Protocol on Flood Protection to the FASRB.

Among the notable achievements during the project implementation are the identified **Areas of Mutual Interest (AMIs)**, which for the first time present specific areas identified as main units considered during the Sava FRMP preparation, and basis for further improvements of the mutual approach to flood risk management in the future.

For achieving the goals of mutual flood risk management in the basin, **42 non-structural** and **38 national structural measures** in AMIs were identified. The national measures are expected to be implemented by the countries, according to applicable national legislation and international requirements. For the non-structural measures, it is needed to further develop specifications of activities to be implemented within each measure, so that costs can be more closely defined and funding sources sought. It is recommended to use the summary of non-structural measures as kind of a “menu of measures” that can be combined, in order to be implemented through national initiatives or international development projects.

Within the project, a **Follow-up Strategy** was prepared, which identified main gaps in the current Plan and recommendations for the next planning cycle. It is hoped that non-structural measures identified in the Plan will allow for improvements in quantity and quality of data available for preparing the next Plan, with **SavaGIS** as the key tool to be used.

In this sense, the **key role of the ISRBC** and its **Secretariat** is clearly identified to facilitate cooperation of the Sava River Basin countries in achieving the common objectives of flood risk management.

It is therefore **recommended to provide the ISRBC Secretariat and the ISBRC permanent bodies with adequate and consistent technical assistance, as well as funding support for implementing the Plan** and recommendations defined within, especially when it comes to **non-structural measures** which will have a key importance for improving cooperation of the countries in the basin, as well as providing better basis for mutual flood risk management planning in the next cycle.

6 ANNEX 1: LIST OF PROJECT OUTPUTS – DOCUMENTS DELIVERED

Below is the list of project outputs - **documents delivered within the project**.

1. For the Inception Phase:
    a. Inception Report with annexes
2. Sava Flood Risk Management Plan for the Sava River Basin (Sava FRMP main document)
3. Sava FRMP Atlas
4. Background document: Summary of the conclusions relevant for the basin drawn from the Preliminary Flood Risk Assessment
5. Background document: Summary of the conclusions relevant for the basin, drawn from the flood hazard and risk maps
6. Background document: Goals of flood risk management of common interest in the Sava River Basin
7. Background document: Catalogue of measures
8. Background document: Summary of measures
9. Background document: Proposal of main elements of a simplified methodology for assessing costs and benefits of measures (CBA methodology) with an accompanying Excel model
10. Background document: Existing and potential retentions
11. Background document: Analysis of proposed measures in the context of potential impacts on environment and environmental objectives of the WFD
12. Background document: Mechanisms of coordination on the basin-wide level and proposal of modes of cooperation of the Sava countries in the flood defense emergency situations
13. Background document: Climate Change and flood risk management planning for the Sava River Basin
14. Background document: Public Participation Process Report
15. For SavaGIS related tasks:
    a. New SavaGIS FRM database model
    b. Report on model integration into SavaGIS
    c. User manual – registered users
    d. User manual – administrators
    e. Sava GIS testing reports
    f. Data exchange database template
    g. Technical documents
16. Strategy for Follow-up